PK

TRANSACTIONS & STUDIES

LIBRARY OF THE
COLLEGE OF PHYSICIANS
OF PHILADELPHIA

AUG 12 1991

of

THE COLLEGE OF PHYSICIANS
OF PHILADELPHIA

MEDICINE & HISTORY

Series V Volume XIII No. 1 MARCH 1991

CAROLINE HANNAWAY, *Editor*

Carla C. Jacobs, *Managing Editor*

College of Physicians of Philadelphia

OFFICERS

Daniel L. Shaw, Jr., M.D., *President*
Robert H. Bradley, Jr., M.D., *President Elect*
John L. McClenahan, M.D., *Secretary*
Joseph A. Wagner, M.D., *Treasurer*
John M. O'Donnell, Ph.D., *Executive Director*

COUNCIL

Mark W. Allam, V.M.D.
Robert Austrian, M.D.*
Herman Beerman, M.D.
Lewis W. Bluemle, Jr., M.D.*
Robert H. Bradley, Jr., M.D.
Lewis L. Coriell, M.D., Ph.D.*
Arthur M. Dannenberg, M.D.
Richard A. Davis, M.D.
John W. Eckman
William C. Frayer, M.D.
William L. Kissick, M.D.
Edithe J. Levit, M.D.
John L. McClenahan, M.D.
Emily H. Mudd, Ph.D.
Frederick Murtagh, M.D.
James A. O'Neill, M.D.
Ann O'Sullivan, R.N., Ph.D.
Robert S. Pressman, M.D.*
Edward J. Resnick, M.D.
Jonathan E. Rhoads, M.D.*
Brooke Roberts, M.D.*
George P. Rosemond, M.D.*
Robert G. Sharrar, M.D.
Daniel L. Shaw, Jr., M.D.
Robert M. Stein, Ph.D.
Edward J. Stemmler, M.D.
Joseph A. Wagner, M.D.
Francis C. Wood, M.D.*

*Former President

* * * * *

Sarah W. Tracy, Copy Editor The Winchell Company, Printers

* * * * *

Transactions & Studies of the College of Physicians of Philadelphia (ISSN 0010-1087) is published four times a year (March, June, September, December) by the College of Physicians of Philadelphia, 19 South 22nd Street, Philadelphia, PA 19103. Second-class postage paid at Philadelphia, PA 19104. POSTMASTER: Send address changes to *Transactions & Studies of the College of Physicians of Philadelphia*, 19 South 22nd Street, Philadelphia, PA 19103.

Subscription correspondence should be sent to the journal at the same address. Subscriptions, U.S.A. and Canada $35.00, foreign $40.00. Single copies, $10.00.

Transactions & Studies of the College of Physicians of Philadelphia is indexed in *Biological Abstracts*, *Chemical Abstracts*, and *Index Medicus*.

TRANSACTIONS & STUDIES

of
THE COLLEGE OF PHYSICIANS
OF PHILADELPHIA

MEDICINE & HISTORY

Series V Volume XIII No. 1 MARCH 1991

Acknowledgments

The publication of this issue of *Transactions & Studies of the College of Physicians of Philadelphia* is made possible through the generosity of:

The M. Louise Carpenter Gloeckner Memorial Fund

The Morris Feld Memorial Fund

Copyright © 1991 by The College of Physicians of Philadelphia

Contents

TRANSACTIONS & STUDIES OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA

Series V Volume XIII Number 1 March 1991

MEDICINE AND HISTORY

Contributors v

SPECIAL ISSUE ON MUSEUMS AND MATERIAL CULTURE

Anatomy and Ambition: The Evolution of a Research Institute
JEFFREY P. BROSCO 1

Wax Models in Dermatology
LAWRENCE CHARLES PARISH
GRETCHEN WORDEN
JOSEPH A. WITKOWSKI
ALBRECHT SCHOLZ
DANIEL H. PARISH 29

Asepsis and the Transformation of Surgical Instruments
JAMES M. EDMONSON 75

COLLEGE LECTURE — The Real Deficit: Child Health and Public Policy in the United States
ANN ROSEWATER 93

Report of the President of the College of Physicians at the Annual Meeting of the Fellowship
DANIEL L. SHAW, JR. 107

REVIEWS

MARK V. PAULY and WILLIAM L. KISSICK, eds.,
Lessons from the First Twenty Years of Medicare: Research Implications for Public and Private Sector Policy
Reviewed by David G. Smith 113

EDWARD B. MACMAHON and LEONARD CURRY,
Medical Cover-Ups In the White House
Reviewed by John L. McClenahan 115

Contents

SALLY SMITH HUGHES, *Ophthalmology Oral History Series, A Link With Our Past: An Interview with Thomas David Duane, M.D.*
Reviewed by William C. Frayer 116

BOOK LIST

JACK ECKERT 119

MEMOIR

Harold Glendon Scheie (1909–1990)
WILLIAM C. FRAYER 121

Contributors To This Issue

JEFFREY P. BROSCO is a doctoral candidate in the History & Sociology of Science Department at the University of Pennsylvania, and is completing an M.D. at the University of Pennsylvania School of Medicine.

JACK ECKERT, M.A. is Curator of Archives and Manuscripts in the Historical Collections of the Library of the College of Physicians of Philadelphia.

JAMES M. EDMONSON, Ph.D. is Curator of the Dittrick Museum of Medical History in Cleveland, Ohio. He teaches the history of medicine at Case Western Reserve University.

WILLIAM C. FRAYER, M.D. is Emeritus Professor of Ophthalmology at the University of Pennsylvania. Dr. Frayer is a member of the council of the College of Physicians of Philadelphia, and a Fellow of the College since 1955.

JOHN L. McCLENAHAN, M.D. is Secretary of the College of Physicians of Philadelphia, and a former editor of the *Transactions & Studies of the College of Physicians of Philadelphia*. He has been a Fellow of the College since 1958.

DANIEL H. PARISH, A.B. is studying in the Department of History, Ludwig-Maxmillians Universität, in Munich, Germany, and is a recipient of a 1990–1991 DAAD Fellowship from Germany.

LAWRENCE CHARLES PARISH, M.D. is Clinical Professor of Dermatology and Director, Jefferson Center for International Dermatology, Jefferson Medical College, Thomas Jefferson University. Dr. Parish has been a Fellow of the College of Physicians of Philadelphia since 1972.

ANN ROSEWATER is Senior Associate at the Chapin Hall Center for Children at the University of Chicago, public policy consultant, and former Staff Director of the Select Committee on Children, Youth, and Families of the U.S. House of Representatives.

ALBRECHT SCHOLZ, M.D. is Director of Dermatology, Out Patient Unit, at the Carl Gustav Carus Medical Academy, in Dresden, Germany.

DAVID G. SMITH, Ph.D. is the Richter Professor of Political Science at Swarthmore College, and is currently working on a book about medicare reimbursement and payment reform.

JOSEPH A. WITKOWSKI, M.D. is Clinical Professor of Dermatology at the University of Pennsylvania School of Medicine, and has been a Fellow of the College of Physicians of Philadelphia since 1968.

GRETCHEN WORDEN is Director of the Mütter Museum, College of Physicians of Philadelphia. She is a member of the Executive Council, European Association of Museums of the History of Medical Sciences.

Anatomy and Ambition: the Evolution of a Research Institute

JEFFREY P. BROSCO

Introduction

The century-old anatomical specimens at the Wistar Institute of Anatomy and Biology have once again been moved to make room for more laboratories. It may seem odd that an institute world renowned for its research on the Wistar rat, the rabies vaccine, and monoclonal antibodies would have museum specimens, but the building was founded in 1892 specifically to house the Wistar and Horner Museum.[1] Begun by Caspar Wistar in 1808 and expanded by his successors in the chair of anatomy in the School of Medicine at the University of Pennsylvania, the museum contains many unique examples of anatomical and embryological anomalies. As the Wistar Institute has grown, however, the museum has itself become an embryological anomaly, a vestigial organ in the nation's first independent biomedical research institute.

In 1906 Robert S. Woodward, president of the Carnegie Institution of Washington, likened the process of the development of that organization "to the struggle of an organism which is trying at once to discover its proper functions and to adjust itself to the conditions of its environment."[2] The Wistar Institute has also undergone a process of evolution, responding to developments in the world of academic biology.[3] Although the institute owes its existence and early direction to General Isaac J. Wistar, great-nephew

1. "The Settlement of the Trust," [1893], reprinted in n.a., *The Wistar Institute of Anatomy and Biology* (Philadelphia, Pa.: George H. Buchanan, 1894) (hereafter, "Settlement, 1893"). This book may be found in the Archives of the Wistar Institute of Anatomy and Biology, Philadelphia, Pennsylvania.

2. Woodward is quoted in Howard S. Miller, *Dollars for Research: Science and its Patrons in Nineteenth-Century America* (Seattle and London: University of Washington Press, 1970), p. 178.

3. Although the history of the Wistar Institute is certainly unique, it mirrors the range of choices and shifting priorities in turn-of-the-century medical science. Charles E. Rosenberg has made this argument in defense of biography. See his "History and Experience," in Charles E. Rosenberg, editor, *The Family in History* (Philadelphia, Pa.: University of Pennsylvania Press, 1975), pp. 1–11; "Science in American Society: A Generation of Historical Debate," *Isis,* 1983, *74*:356–367; and most recently, "Making It in Urban Medicine: A Career in the Age of Scientific Medicine," *Bulletin of the History of Medicine,* 1990, *64*:163–186.

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 1-28
© 1991 by The College of Physicians of Philadelphia.

of Caspar, the discrete historical stages of the institute coincide with the tenure and ambition of its directors, who have sought to advance anatomy and to increase the status of the institute. Depending on his view of contemporary academic biology, each director has shifted the resources of the institute toward a different program of science and education. From 1894 to 1905, director Horace Jayne focused on the institute's anatomical collection as a resource for research and teaching. In 1905 Jayne's successor, Milton J. Greenman, adopted the suggestions of a nationally prominent group of anatomists when he began programs of journal publication, laboratory animal development, and experimental research in neurology and embryology.

Greenman's plans reflect the growing importance of research in America at the turn of the century. University scientists were learning the latest experimental techniques in Germany and founding new Ph.D. programs, journals, and disciplinary societies in America. Technologically-oriented industries and government agencies were supporting research to improve market position or rationalize resource management. The creation of independent science institutes such as the Rockefeller and Wistar, Robert Kohler has argued, signaled "the new significance that was attached to the idea of research in the Progressive period: research as a profession, as service, as producer of new kinds of goods and services."[4]

Conceptions of what constituted scientific research also changed rapidly during this time, especially in the emerging field of biology. Historians such as Garland Allen have focused on the scientists who emphasized experimental work in research laboratories and rejected the older tradition of descriptive studies in natural history museums.[5] More recently, Ronald Rainger, Keith R. Benson, Jane Maienschein, and others have challenged this view, suggesting that "biology" was not one entity: it included scientists working in museums, laboratories, and in the field. Experimental methods existed side-by-side with natural history in the different

---

4. Robert E. Kohler, "Medical Reform and Biomedical Science," in Morris J. Vogel and Charles E. Rosenberg, editors, *The Therapeutic Revolution* (Philadelphia, Pa.: University of Pennsylvania Press, 1979), p. 53.

5. Garland Allen, *Life Sciences in the Twentieth Century* (Cambridge: Cambridge University Press, 1978). See also William Coleman, *Biology in the Nineteenth Century: Problems of Form, Function, and Transformation* (New York: Cambridge University Press, 1977) and Gerald L. Geison, *Michael Foster and the Cambridge School of Physiology: The Scientific Enterprise in Late Victorian Society* (Princeton, N.J.: Princeton University Press, 1978).

subdisciplines: physiology, ecology, zoology, botany, embryology, taxonomy, biochemistry, and anatomy. In their volume *The American Development of Biology,* Rainger, Benson, and Maienschein present a collection of essays that together define biology at the turn of the century.[6]

The history of the Wistar Institute adds another piece to this mosaic definition of biology: as a center of research and publishing on anatomy, the institute represented one strategy of American anatomists to redefine their work as modern experimental science. Progressive-era anatomists felt besieged on all sides. The newly emerging practices in physiology, embryology, and biochemistry were attracting the best young scientists, and the traditional stronghold for anatomists, the medical school, was adding laboratories and radically reforming its curricula and entrance requirements.[7] The Wistar Institute's shift from museum to laboratory-research institute was a response of anatomists to perceptions of a changing standard of scientific prestige.

The Founding of the Institute

On 31 May 1888 a fire in Medical Hall (now Logan Hall) destroyed books, equipment, and a good portion of the Wistar and Horner Museum. At a special meeting the next day, the medical school faculty of the University of Pennsylvania instructed professor of anatomy Joseph Leidy to appoint a full-time museum curator to

---

6. See the editors' "Introduction" in Ronald Rainger, Keith R. Benson, and Jane Maienschein, editors, *The American Development of Biology* (Philadelphia, Pa.: University of Pennsylvania Press, 1988) for an excellent overview of the work and goals of this "revisionist" school in the history of biology. See also Philip J. Pauly, "The Appearance of Academic Biology in Late Nineteenth-Century America," *Journal of the History of Biology,* 1984, *17*:378–382; Philip J. Pauly, *Controlling Life: Jacques Loeb and the Engineering Ideal in Biology* (New York: Oxford University Press, 1987); Jane Maienschein, "Physiology, Biology, and the Advent of Physiological Morphology," in Gerald L. Geison, editor, *Physiology in the American Context, 1850–1940* (Bethesda, Md.: American Physiological Society, 1987), pp. 177–193; Jane Maienschein, "Shifting Assumptions in American Biology: Embryology, 1890–1910," *Journal of the History of Biology,* 1981, *14*:89–112; and Keith Benson, "American Morphology in the Late Nineteenth Century: The Biology Department at Johns Hopkins University," *Journal of the History of Biology,* 1985, *18*:163–205.

7. Although he is most interested in biochemistry, Robert Kohler describes the pressures on other biomedical disciplines to adapt to the changes in the structure of medical education. See especially chapters six and seven in Robert E. Kohler, *From Medical Chemistry to Biochemistry: The Making of a Biomedical Discipline* (Cambridge: Cambridge University Press, 1982).

serve during the emergency.[8] Leidy had long argued that the museum needed a curator to organize the collection and replace worn-out specimens, and this incident justified his request.[9] Within a year, Leidy began to replace the lost specimens and to build a subscription of $1,800 to pay the curator's salary. One subscriber, General Isaac J. Wistar, pledged $250 to help the museum his great-uncle had founded.[10]

Wistar was part of an old and respected Quaker family. After several years at Friends' Select School and Haverford College, he left Philadelphia for the adventures of frontier life in the California gold rush of 1849. He pursued a series of small business ventures, then settled in San Francisco to study law. Wistar returned to Philadelphia in 1857, where he helped command a local regiment of the Union army during the Civil War. After the War, he managed the state canal system for the Pennsylvania Railroad Company, and by the 1880s he was president of the Pennsylvania Canal Company and vice-president of several coal and railroad companies.[11]

As a respected member of the community, Wistar often shared his strong opinions in newspaper articles.[12] He stressed the importance of law and order for the stability of the community, yet opposed government restraints on individual rights, especially where business was concerned.[13] Although sophisticated enough

---

8. Minutes of the Faculty of the Medical Department of the University of Pennsylvania, 1 June 1888, University of Pennsylvania Archives, Philadelphia, Pennsylvania (hereafter, Faculty Minutes).

9. *Provost's Report to the Trustees of the University of Pennsylvania,* 1889, p. 86, University of Pennsylvania Archives (hereafter, *Provost's Report*); see also Faculty Minutes, 1 May 1888.

10. Faculty Minutes, 19 November 1888, 17 December 1888, 18 February 1889, 15 April 1889, 21 October 1889, and 19 May 1890.

11. Isaac J. Wistar, *Autobiography of Isaac Jones Wistar: Half a Century in War and Peace* (Philadelphia, Pa.: Wistar Institute Press, 1937); Milton J. Greenman, "Appendix IX. Report of the Director of the Wistar Institute of Anatomy and Biology," *Provost's Report,* 1906, pp. 180–181; letter from Wistar to Samuel Dickson, 28 January 1892, file "Archives General-1892, Wistar Institute," University of Pennsylvania Archives.

12. Wistar kept two scrapbooks of his many essays and letters that were published in newspapers and journals. His opinions were also solicited by newspapers; for example, Wistar defended the mob that lynched a black man accused of murder on the grounds that the state failed in its duty to give the man an early trial date. *Philadelphia Press,* 25 June 1903 and *Baltimore Sun,* 26 June 1903: pasted in Wistar's scrapbook "Scraps, Personal, II," pp. 74–75, Wistar Institute Archives.

13. Wistar worried that his fortune was subject "to all the contingencies of invested property in a country where such property receives little favor and is exposed to constant attack from predatory legislation." Letter from Wistar to Harrison Allen, 12 February 1894, Wistar Institute Archives.

to quote the French publicist M. Alfred Fouillée and the English philosopher John Stuart Mill in an essay on the requirements of citizenship and universal suffrage, Wistar was primarily a man of action.[14] In response to labor riots in Pittsburgh in 1877, for example, Wistar offered to restore order by force. The Governor, however, could not assure Wistar that he would be safe from legal action by the relatives of the men who might be killed. Wistar did not go to Pittsburgh.[15]

While he was a practical businessman, Wistar nevertheless held a prevailing faith in science.[16] He believed that advances in chemistry, biology, geology, and physics were largely responsible for economic and social progress and that application of these sciences had "immeasurably increased the activity, comfort and average length of our lives."[17] Wistar thought that society would extract the full benefits of science only by educating both students and the general public. In 1892 he became president of the Academy of Natural Sciences in Philadelphia as part of a movement within the academy to revitalize its ties to scientific research on one hand and the community on the other.[18] Like many of his contemporaries, Wistar saw museums as important educational tools and as symbols of the city's cultural progress. Thus in 1896 Wistar surveyed anatomical and natural history museums in Europe in hopes of improving those in Philadelphia.[19]

As Wistar became more involved in Philadelphia's academic, business, and civic-minded community, he extended his financial

---

14. Isaac J. Wistar, "Education Versus Crime: Something More Than Reading, Writing, and Arithmetic Required for Public Security," in "Scraps, Personal, I, Wistar Institute Archives."

15. Charles B. Dougherty, "The Reminiscences of General Isaac Jones Wistar, USV," read before the Wyoming Historical and Geological Society, 14 April 1916, and reprinted from *Reports and Collections of the Society,* vol. 25, Wistar Institute Archives.

16. In a letter to University of Pennsylvania provost William Pepper, for example, Wistar suggested that Pepper look outside the pool of university trustees in choosing the Wistar Institute's board: "The prevailing qualities in our Board, as in all governing Boards, should be those pertaining to administration. But that would be quite consistent with some enlightening sprinkles or leaven of scientific men . . . ." Letter from Wistar to Pepper, 2 December 1893, "Archives General-1893, Wistar," University of Pennsylvania Archives.

17. Wistar, *Autobiography,* pp. 1–2.

18. "The Academy of Sciences," *Evening Bulletin,* 8 March 1892, in "Scraps, Personal, I," p. 90, Wistar Institute Archives.

19. "Anatomical Museums: General Wistar's Observations on Foreign Collections," *Public Ledger,* 24 October 1896, "Scraps, Personal, I," p. 130, Wistar Institute Archives.

commitment to the Wistar and Horner Museum. In 1891 he put $17,537 into trust to provide the medical department of the University of Pennsylvania with an annual income for the preservation, arrangement, and increase of the museum.[20] But this was only a temporary measure. With prompting from William Pepper, the university provost, Wistar soon decided to establish an institute around the museum collection. He thought that the museum was cramped in tiny quarters and that a large fireproof building was needed for proper display of objects and for accessibility. He also wished to perpetuate the name of his great uncle, Caspar Wistar, who had collected the specimens that began the museum.[21]

Wistar and Pepper agreed to incorporate an independent institution with strong organizational ties to the university. Wistar, with his shrewd business and legal mind, favored this arrangement because he was not willing to give complete control of "his" institute to the university. Although the university's Committee on Law questioned the legality of the arrangement and deplored the mistrust that underlay Wistar's plans, they agreed that the long-term well-being of the institute was their first priority.[22] On 8 March 1892 Wistar agreed to seek a charter from the State of Pennsylvania for the "Wistar Institute of Anatomy and Biology," construct a building, and donate an endowment in exchange for the university's commitment to give the institute the contents of the Wistar and Horner Museum and a plot of land bounded by Spruce Street, 37th Street, and Woodland Avenue.

On 1 September 1893 Wistar, Pepper, and witnesses signed the Settlement of the Trust, a 20-page document which detailed Wistar's vision of the institute.[23] In addition to $100,000 for constructing

---

20. Deed of Trust, 20 July 1891, Wistar Institute Archives.

21. "General Wistar Talks of his Gift," *Philadelphia Press,* 9 March 1892, "Scraps, Personal, I," p. 1893, Wistar Institute Archives; Esther H. Wistar, daughter-in-law of Caspar Wistar, noted the fortunate consequence of naming the institute after his own great uncle: "[Y]ou have certainly made a striking and magnificent monument to *your* name in the interest of science . . . . " Letter from Esther H. Wistar to Isaac J. Wistar, 25 November 1893, Wistar Institute Archives.

22. The few pieces of correspondence remaining hint at the flavor of the negotiations but do not provide a detailed account. Wistar to Samuel Dickson, chairman of the university's Committee on Law, 29 January 1892; Dickson to Wistar, 27 January 1892; Wistar to Dickson, 28 January 1892; Wistar to Dickson, 30 January 1892; [Arthur Meigs] to William Pepper, 30 January 1892; Dickson to Wistar, 1 February 1892; and Wistar to Dickson, 10 February 1892. File "Archives General-1892, Wistar Institute," University of Pennsylvania Archives.

23. See Howard Miller, *Dollars for Research,* for an excellent overview of the style of late nineteenth-century patronage of science.

the building, Wistar deposited securities valued at $130,000 with a trust company to provide a permanent annual income. The board of managers would consist of nine members: six elected by the university's board of trustees, two designated by the Academy of Natural Sciences, and one as a representative of the Wistar family. The board of managers would in turn elect a president, a secretary, a treasurer, and a director to manage the institute.[24]

According to the language of the trust, the institute's principal object would be "the safe preservation, intelligent arrangement, and free exhibition of the Anatomical Museum," but the board of managers could initiate "any other work for the increase of original scientific knowledge."[25] The museum was open to all: the general public and undergraduate students could view the exhibits, and postgraduate students and doctors could use the anatomical preparations for "advanced researches." There was no formal instruction, however, in the institute and undergraduate teaching there was explicitly forbidden.[26] In an era of stiff competition for students, the Wistar Institute did not want to threaten the university's medical school; more important was the fear that a heavy teaching burden would inhibit museum and research work.

In 1894 the building was completed. Four stories high and made entirely of incombustible materials, it included three large museum halls, a library, workshops for the preparation and mounting of specimens, and rooms for lectures, microscopy, photography, and anatomical research.[27] During January and February of 1894, the contents of the Wistar and Horner Museum were transferred to the newly built display cases of the institute. George A. Piersol, a former curator of the museum and later professor of anatomy, was in charge of the removal of the museum's 4,181 specimens. He retained 720 of them on loan because they were needed by the medical school to teach anatomy.[28] Medical students were required to dissect human cadavers after 1877, but fixed specimens — usually examples of pathological anatomy — were still found helpful in

24. "Settlement, 1893."
25. "Settlement, 1893," p. 27.
26. "Settlement, 1893," p. 27.
27. "The Wistar Institute of Anatomy and Biology," n.a., *Wistar Institute*, p. 37.
28. "Report of Committee on Wistar and Horner Museum," 15 January 1894, Faculty Minutes, 15 January 1894, pp. 174–175; Milton J. Greenman, "Report to the President and Board of Managers of the Wistar Institute," 18 June 1924, p. 8, Wistar Institute Archives.

demonstrations.[29] In exchange for this teaching material, the medical faculty allowed the portraits of Caspar Wistar, William Horner, and Joseph Leidy to hang in the Wistar Institute.[30]

The Museum as Textbook: 1894–1905

Although the legal organization of the institute did not give Wistar greater power than that of any other member of the board of managers, he clearly dictated policy in its early years. Once Wistar committed his money to founding a new institute, he needed to determine the best way to spend the money to advance anatomy and biology most efficiently: "Should [the limited income of the institute] be primarily devoted to stimulating original research and the publication of results, with the view of acquiring an immediate Scientific Status? or should it be applied first to the restoration and extension of the museum, leaving investigation and study to grow out of that naturally, and later?"[31]

Provost Pepper recommended hiring the anthropologist Franz Boas to give the institute immediate scientific status: "[Y]ou would get more out of this investment than you are likely to do in any other way."[32] Others argued that a museum of comparative anatomy was the best way to develop the institute. The University of Pennsylvania zoologist Horace Jayne, for example, discussed with Wistar the cost, aesthetics, efficiency, space requirements, and intellectual coherence of several different plans for a museum.[33] Wistar finally decided that a valuable and comprehensive museum was more likely to build a scientific reputation for the institute than a program of research and publishing.[34] Here, Wistar responded to the wide-

29. George W. Corner, *Two Centuries of Medicine: A History of the School of Medicine, University of Pennsylvania* (Philadelphia and Montreal: J. B. Lippincott, 1965) pp. 155–156.

30. Faculty Minutes, 15 January 1894, 19 February 1894, and 19 March 1894.

31. Letter from Wistar to Harrison Allen, 12 February 1894, Wistar Institute Archives.

32. Letter from William Pepper to Wistar, 27 November 1893, Wistar Institute Archives.

33. Horace Jayne, "Suggestions for Museum Buildings," 8 March 1892, Wistar Institute Archives. After reading a newspaper account of the proposed Wistar Institute, Jayne's colleague John A. Ryder sent Wistar a sketch of his ideas for the museum. Letter from Ryder to Wistar, 26 December 1892, Wistar Institute Archives.

34. Wistar was also wary of the on-going costs of publishing scientific papers: it seems that, for Wistar, promoting research also meant paying for publication. Letter from Wistar to Harrison Allen, 12 February 1894, Wistar Institute Archives.

spread popularity of natural history museums among both the public and the scientific community in the late nineteenth century.[35]

With museum work as its primary mission, the Wistar Institute was formally opened on 21 May 1894. Newspaper accounts of the official opening were uniformly positive, noting the benefits of the institute to the city of Philadelphia. The *Evening Telegraph* called it "a goodly deed well done [by which] not only the University directly, but this whole community indirectly, will profit."[36] The *Philadelphia Ledger* cited Wistar's gift as evidence of the advanced state of Philadelphia society: "The generous gift . . . by General Isaac J. Wistar for a museum of biology and anatomy in connection with the University of Pennsylvania, would be heralded over the whole country, if such munificence towards the cause of higher education and of charity were not so frequent in Philadelphia."[37]

The opening day activities included speeches and a tour of the institute's facilities for invited guests. In his opening remarks, Provost William Pepper focused on the unique relationship of the institute to the university. The "distinct individuality" of the institute within the university context was a tribute to the flexibility of the central administration in accommodating other institutions. Pepper argued that the "concentration and co-operation" of resources in such schemes was the most efficient way to advance learning and knowledge.[38] The institute accorded with Pepper's vision of the university as a "voluntary association of all persons and of all

---

35. Sally G. Kohlstedt has called the late nineteenth-century "the museum age" in America. For a study of natural history museums and their public and scientific roles, see Kohlstedt, "International Exchange and National Style: A View of Natural History Museums in the United States, 1850–1900," in Nathan Reingold and Marc Rothenberg, editors, *Scientific Colonialism: A Cross-Cultural Comparison* (Washington, D.C.: Smithsonian Institution Press, 1987), pp. 167–190; Kohlstedt, "Museums on Campus: A Tradition of Inquiry and Teaching," in Rainger, Benson, and Maienschein, editors, *American Development of Biology,* pp. 15–48; and Keith R. Benson, "From Museum Research to Laboratory Research: The Transformation of Natural History into Academic Biology," also in *American Development of Biology,* pp. 49–83.

36. *Evening Telegraph,* 8 March 1892, "Scraps, Personal, I," p. 93, Wistar Institute Archives.

37. "The University of Pennsylvania and the Academy of Natural Sciences," *Philadelphia Ledger,* 16 March 1892, "Scraps, Personal, I," p. 94, Wistar Institute Archives. See also "The Wistar Institute of Anatomy and Biology: Magnificent Home Provided for the New Department of the University of Pennsylvania by General Wistar," *Philadelphia Press,* 1 December 1892, "Scraps, Personal, I," p. 92, Wistar Institute Archives.

38. William Pepper, "Introductory Remarks at the Opening of the Wistar Institute of Anatomy and Biology," n.a., *Wistar Institute,* pp. 38–43.

agencies who wish to unite in work for the elevation of society by the pursuit and diffusion of knowledge and truth."[39] He also saw it as an important addition to the institutionalization of research at the university. The Wistar Institute would provide increased facilities for investigative work in biology, just as the newly founded Institute of Hygiene (1892) and the William Pepper Clinical Laboratories (1894) expanded opportunities for scientific medicine.[40]

Harrison Allen, the first director, affirmed the twin goals of the institute in his opening day speech: to manage the Wistar and Horner Museum and to give advanced biology students an opportunity to pursue research in anatomy.[41] His specific suggestions for research included the anatomy of animals related to man and the anatomy of the several races of men with a view towards gaining an understanding of differential susceptibility to disease. Acknowledging the influence of the English anatomist John Hunter, Allen argued that the museum should be a systematic source of information for the viewer; he stressed the metaphor of the "museum as a book made up of many chapters, each specimen being an illustration."[42]

Citing outside commitments that prohibited his devoting full attention to the institute, Allen resigned a few months later.[43] His successor, Horace Jayne, was a wealthy University of Pennsylvania Medical School alumnus who had spoken to Isaac Wistar during the early planning stages of the institute. Jayne was dean of the faculty of the college from 1888 until he replaced Allen in 1894. Although Jayne also favored focusing the institute's resources on museum work, he saw this as compatible with scientific research. Jayne had studied zoology in Europe and at the Johns Hopkins University, and was part of an emerging elite in America for whom scientific research had both symbolic and substantial value. In 1884 he had helped found the school of biology, a department of the

---

39. William Pepper, "Appendix No. 1. The Provost's Letter of Resignation," *Provost's Report,* 1894, pp. 34–35.

40. William Pepper, *Provost's Report,* 1893, p. 17. See Edward T. Morman, "Clinical Pathology in America, 1865–1915: Philadelphia as a Test Case," *Bulletin of the History of Medicine,* 1984, *58*:198–214, for an excellent survey of the institutional changes in Philadelphia medicine at the turn of the century.

41. Harrison Allen, "The Objects of the Wistar Institute," in n.a., *Wistar Institute,* pp. 61–62.

42. Allen also mentioned John Ryder as a contributor to this view of the anatomical museum, Ibid., pp. 66–67.

43. *Provost's Report,* 1898, p. 3.

University of Pennsylvania designed to promote advanced scientific study.[44]

Jayne's program for the institute reflects his view of research and museums. Echoing Harrison Allen, Jayne wrote that the "museum of The Wistar Institute is a text-book illustrated by the specimens themselves."[45] He planned exhibitions in six areas: systematic anatomy, topographical and surgical anatomy, embryology, teratology, morbid anatomy, and physical anthropology. Each exhibit, if carefully planned and copiously labeled, would provide a valuable education for the beginning student in biology. These "educational exhibits" were complemented by the "reserve collection," which was the raw material for the museum display and original investigation. Jayne's research interests — natural classification and comparative anatomy — were more traditional than the laboratory methods gaining favor elsewhere, but his concept of providing an institutional locus for research without teaching was innovative. He proposed a scientific staff of "associates," scientists who had already proven themselves, and "fellows," junior investigators eager for research opportunities. In addition to their own research, the members of the scientific staff were expected to help provide the "text" and the layout of the educational exhibits.[46]

By dividing the collection of the museum and by prohibiting formal teaching, Jayne hoped that investigators would be free to pursue their research. The institute was set up to attract established scientists and to provide young scientists with support during the first few — trying — years of their careers.[47] William G. Spiller and Thomas H. Montgomery, for example, both spent time in the Wistar laboratory and published papers that were credited to the institute.[48] In his yearly reports to the provost from 1896 to 1904, Jayne

---

44. Corner, *Two Centuries of Medicine,* p. 163.

45. Horace Jayne, "The Wistar Institute of Anatomy and Biology: Its Scope and Organization," undated pamphlet, [1898], p. 2, Wistar Institute Archives.

46. Ibid., pp. 4–13.

47. Ibid., p. 13.

48. Greenman, "Report to the President," 18 June 1924, pp. 18–20. William G. Spiller went on to become a professor of neurology at the University of Pennsylvania. After several years as director of the museum at the Wagner Free Institute and assistant professor of zoology at the University of Pennsylvania Thomas H. Montgomery continued his career in anatomy and zoology at the University of Texas. See their entries in James McKeen Cattell, ed., *American Men of Science: A Biographical Dictionary* (New York: Science Press).

noted other scientists and students who pursued research at Wistar but did not necessarily publish.[49]

Jayne's plans to provide an institutional locus for basic research and to educate the public were only partly successful. In 1897 Jayne employed an assistant director, an engineer, a clerk, a janitor, a student assistant, and several machinists for building metal and glass museum cases.[50] The unsalaried scientific staff was small and spent much time and energy cataloguing specimens and setting up the educational exhibits — perhaps a greater burden than teaching. Jayne did add 10,690 specimens to the original collection of 3,461, but he began to display them with an eye toward their immediate appeal rather than their systematic educational value. For example, a 70-foot-long skeleton of a fin-back whale was suspended from the ceiling of the upper exhibition hall.[51] Jayne claimed that a large number of students took advantage of the "textbook" display of collections, though only a series on the osteology of the skull was exhibited in the textbook style implied by Jayne's programmatic statement.[52]

Although General Wistar was occupied with business concerns and with his appointment as a state penal advisor, he kept a close watch on his institute. As a member of the board of managers, Wistar attended every meeting and acted as its secretary. In 1897 he paid $45,000 for a second building to provide space for a steam heating plant and electric light equipment, and the next year he donated another large portion of his fortune ($300,000) to the institute.[53] Concerned with future needs for expansion, Wistar also began a "contingency fund" to be built up to two hundred thousand dollars. He gave a detailed description of materials to be used in constructing future institute buildings, explaining to fellow board members that "we are not constructing a mere plaything for our own time, but an enduring monument for a far stretching

---

49. Horace Jayne, "Report of the Director of the Wistar Institute of Anatomy and Biology," *Provost's Report,* 1896–1904.

50. Greenman, "Report to the President," 18 June 1924, p. 12.

51. The magnificent specimen was presented to the museum by the biological department from collections bequeathed by Edward D. Cope. Jayne, "Report of the Director," *Provost's Report,* 1898, p. 159.

52. Jayne, "Report of the Director," *Provost's Report,* 1897, pp. 155–156.

53. Greenman, "Report to the President," 18 June 1924, p. 14; Letter from Wistar to Charles C. Harrison, provost, 20 June 1898, "Archives General-1898, Wistar Institute," University of Pennsylvania Archives.

future . . . . "[54] By late 1904 Wistar had become thoroughly disgruntled with Jayne's performance and asked for his resignation.[55] The first era of the Wistar Institute ended with a vastly expanded museum and no outstanding debts, but with little national prestige.

The Central Anatomical Institute: 1905–1925

Isaac Wistar still dictated policy in 1905. He asked the assistant director, Milton J. Greenman, to replace Horace Jayne, and the board of managers quietly confirmed Greenman's nomination at the next meeting.[56] Greenman earned both his Ph.D. (1889) and his M.D. (1892) from the University of Pennsylvania. He had studied zoology with Leidy and Jayne before becoming assistant director of the institute.[57] As assistant director, Greenman had been in charge of mounting preparations, designing and building display cases, and managing the day-to-day operations of the museum. He was also an informal apprentice to Wistar and learned to handle business affairs, becoming in the process the General's good friend.[58]

Greenman's ambition as director was clear: he "desired to make the Institute a central station for anatomical research in the country, and for this purpose to co-operate in every way possible with University work in this field."[59] With Wistar's permission, he convened an advisory board of America's leading anatomists and zoologists.[60] The scientists invited to Philadelphia in April 1905 were Lewellys F. Barker (professor of anatomy, University of Chicago), Edwin G. Conklin (professor of biology, University of Pennsylvania), Henry H. Donaldson (professor of neurology, University of Chicago), Simon H. Gage (professor of histology and embryology, Cornell University), G. Carl Huber (professor of histology and embryology, University of Michigan), George S. Huntington (professor of anat-

---

54. "A letter from Isaac J. Wistar to future officers and managers and to the trustees of the Wistar Institute of Anatomy and Biology and its estates," 14 July 1902, reprinted in *Wistar Institute,* p. 5.

55. Greenman, "Report to the President," 18 June 1924, p. 22.

56. Greenman, "Report to the President," 18 June 1924, p. 23; Board of Managers Minutes, 11 January 1905, Wistar Institute Archives.

57. Henry H. Donaldson, "Milton J. Greenman," *Anatomical Record,* 1937, *68*:262–265.

58. Greenman, "Report to the President," 18 June 1924, pp. 14–15 and 20–21.

59. An untitled history of the institute, September 1905, Wistar Institute Archives; also see Greenman, "Appendix IX. Report of the Director," *Provost's Report,* 1906, p. 183, and 1907, pp. 179–180.

60. Greenman, "Report to the President," 18 June 1924, pp. 24–25.

omy, Columbia University), J. Playfair McMurrich (professor of anatomy, University of Michigan), Franklin P. Mall (professor of anatomy, the Johns Hopkins University), Charles S. Minot (professor of histology and embryology, Harvard Medical School), and George A. Piersol (professor of anatomy, University of Pennsylvania).

The advisory board recommended that the principal object of the institute should be research, specifically in neurology, embryology, and comparative anatomy. They adopted Greenman's idea for a central institute of anatomy by creating sub-committees to promote national research.[61] The Wistar Institute would serve as the hub where the committees would meet to coordinate various proposals, collect and distribute research materials, and then collate and correlate findings from geographically dispersed scientists.[62] The advisory board also suggested that the institute establish relations with the Association of American Anatomists (AAA), an organization founded in 1888 to promote anatomy as an experimental science, and grant a subvention to the *Journal of Anatomy,* the AAA's official organ.

Newspapers expressed the same enthusiastic and positive response to the conference of anatomists as they had to the institute's founding, but with one important difference. Several articles noted that part of the institute's claim to the role of central anatomical institute lay in its fiercely guarded independence, stipulated by Wistar in its founding.[63] This contrasts with an earlier emphasis on the institute as a "department" of the University of Pennsylvania, which had lent immediate legitimacy to the fledgling institute. Throughout its history, the institute used its informal connection to the university in order to enhance its public image.[64]

---

61. Ibid., pp. 25–26.

62. "Eminent Anatomists to Meet Next Week: Wistar Institute May Become Permanent Anatomical Center," *Old Penn: Weekly Review of the University of Pennsylvania,* 8 April 1905, "Scraps, Personal, II," p. 87, Wistar Institute Archives.

63. "It has been suggested that, on account of its independent organization, the Wistar Institute might become the anatomical centre . . . . " "A Conference of Anatomists: To Establish Central Institution for Investigation," [Unknown newspaper], 30 March 1905, "Scraps, Personal, II," p. 85, Wistar Institute Archives.

64. When the question arose whether the scientific staff should be eligible for retirement allowances from the Carnegie Foundation for the Advancement of Teaching, for example, Wistar president Charles C. Harrison argued that the institute was an integral part of the University of Pennsylvania and that therefore their staff deserved to be included in the pension plan. This was especially important because the institute needed to be able to offer pensions to be competitive for "desirable" professors. After two years of debate, the Carnegie Foundation did offer the allow-

Henry H. Donaldson, a member of the advisory board, described the conference in his diary as "a good experience — Think we may help the institute to do things in neurology."[65] One year later he was to launch a program in neurology as the institute's first scientific director, a job for which he was well trained. After earning a B.A. from Yale in 1879, Donaldson stayed on for another year to study chemical physiology with Russell H. Chittenden, a leading advocate of laboratory research. He started medical school at the College of Physicians and Surgeons in New York but quickly transferred to the Johns Hopkins, where he earned a Ph.D. in biology in 1885 under the direction of G. Stanley Hall. While at Hopkins, Donaldson was part of an important movement to define biology as a core discipline in America. Although Hopkins professors H. Newell Martin and William K. Brooks separated physiology from morphology, Donaldson and other students such as E. B. Wilson, Edwin G. Conklin, and Thomas H. Morgan freely intermingled the two scientific subjects.[66] Donaldson studied neurology in Europe for a year and a half, then in 1889 followed Hall to Clark University to be assistant professor of neurology. In 1892 Donaldson became professor of neurology at the University of Chicago, where he helped Charles O. Whitman develop the richly endowed Hull Biological Laboratories until 1905 when he moved to Philadelphia.[67] In addition to his reputation as a scientist, Donaldson was chosen to direct the research program because he shared Greenman's desire to increase the scientific prominence of the Wistar Institute.[68]

---

ances to Wistar staff. Board of Managers Minutes, 19 February 1910 and 19 December 1912. Rosemary Stevens's argument that a flexible, ambiguously-defined institution often has a competitive advantage in responding to changes in its environment certainly can be applied to the Wistar Institute. "A Poor Sort of Memory: Voluntary Hospitals and Government Before the Depression," *Milbank Memorial Fund Quarterly,* 1982, *60*:551–584.

65. Henry H. Donaldson, personal diary (unpublished), vol. 16, 13 April 1905, H. H. Donaldson Papers, American Philosophical Society Library, Philadelphia, Pennsylvania.

66. Pauly, "The Appearance of Academic Biology," pp. 378–382. See also Jane Maienschein, "Physiology, Biology, and the Advent of Physiological Morphology," in Geison, editor, *Physiology in the American Context,* pp. 177–193.

67. Edwin G. Conklin, "Biographical Memoir of Henry Herbert Donaldson, 1857–1938," *Biographical Memoirs of the National Academy of Sciences,* 1939, *20*:229–243.

68. Donaldson's diaries document at least seven meetings with Greenman in 1905 before he was named professor of neurology at the Wistar Institute. Personal diary, vol. 16, 1905. On 19 February 1906, Donaldson wrote "Wistar Institute accepted as Central Institute for brain investigation in U.S . . . . An important step." Personal diary, vol. 17, 19 February 1906. Donaldson also spent two months in

From 1905 to 1925 the Wistar Institute's commitment to research grew rapidly under the direction of Greenman and Donaldson. The number of personnel increased from eleven to forty-five. By 1905, 10 papers had been published by individuals working in Wistar laboratories; between 1905 and 1925, 277 papers were published by the Wistar staff and visitors.[69] More important than the quantity of research, however, was the concentration of that research on the growth and development of the albino rat.[70]

Just before Donaldson came to Wistar, he decided that the rat was an ideal choice for a laboratory animal, since its nervous system grew in the same manner as that of humans but 30 times as fast. He raised a pure-bred stock of rats to eliminate individual fluctuations in growth as much as possible, and in 1915 Donaldson developed a standard growth summary which was published as *The Rat: Reference Tables and Data for the Albino Rat and the Norway Rat.*[71] Besides providing a standard reference work on the rat, the institute also sold stock from its colony starting in 1912.[72] More than just learning about the rat, however, Donaldson was developing a dynamic experimental system — the rat as a whole — that many other laboratories would soon adopt as an appropriate way to study biological processes *in vivo*. By 1938 the albino rat had become the world's most widely used laboratory mammal; this work helped establish the fame of the Wistar Institute at least as securely as any particular research discovery.[73]

Europe with Greenman in 1906 visiting various research laboratories and anatomical institutes. Greenman, "Report of the Director," *Provost's Report,* 1906, pp. 183–184.

69. Milton J. Greenman, "The Wistar Institute of Anatomy and Biology and Its Advisory Board," *Twentieth Anniversary of the Organization of the Advisory Board of the Wistar Institute of Anatomy and Biology,* 13 April 1925, p. 37, Wistar Institute Archives.

70. Of the 202 scientific papers published in this period, 174 were on the anatomy and physiology of the rat, and 65 of those were on the rat's nervous system. Donaldson, "Research at the Wistar Institute, 1905–1925," *Twentieth Anniversary,* pp. 48–49.

71. Published by the Wistar Institute in 1915 as part of a series entitled, *Memoirs of the Wistar Institute of Anatomy and Biology* (Number 6).

72. J. Russell Lindsey, "The Laboratory Rat," in Henry J. Baker, J. Russell Lindsey, and Steven W. Weisbroth, editors, *Biology and Diseases,* vol. I (New York: Academic Press, 1979), p. 10.

73. Conklin, "Biographical Memoir," p. 233. See Adele E. Clarke, "Research Materials and Reproductive Science in the United States, 1910–1940," in Geison, editor, *Physiology in the American Context,* pp. 323–350, for an excellent introduction on the much neglected topic of where scientists found the animal subjects for their experiments.

Donaldson and his students first studied the growth of the rat, then focused on its nervous system. They carried out a long-term series of studies comparing the growth of several organs by weight in rats and monitoring the effects of age, domestication, exercise, diet, and castration (see Table I). To coordinate data from many researchers, Donaldson consciously imitated Carl Ludwig, the German physiologist: Donaldson always read and critiqued the papers of junior researchers to integrate their data with the institute's previous findings.[74] This concentration of research effort on the albino rat growth parallels the research methods of Thomas H. Morgan, the experimental embryologist at Columbia who led a group in mapping the genes of *Drosophila* (a small two-winged fly). Both chose particularly appropriate research animals and developed standard techniques that assured productive and meaningful research projects for incoming students.[75] By 1938 over four hundred separate articles and monographs on the rat had been published by Donaldson, his colleagues, and his students.[76]

Although there was a continual procession of students and junior researchers through the institute, the core scientific staff — Donaldson, Greenman, Shinkishi Hatai, and Helen Dean King — provided stability from year to year.[77] Hatai started in 1906 and King in 1909; both worked their way up from research assistants under Donaldson to professorships in the institute. Occasionally established scientists such as G. Carl Huber would work in the institute on a year-long fellowship, but the majority of researchers were graduate students and young scientists who benefited from the opportunity to pursue research without the burden of undergraduate teaching. After several years of the Wistar research experience, many students became teachers and researchers at universities throughout the world, thus increasing the institute's international

---

74. Donaldson, "Research at the Wistar Institute," p. 47. Ludwig taught many prominent American scientists, including William H. Welch, Henry P. Bowditch, Franklin P. Mall, and John J. Abel. Erwin H. Ackerknecht, *A Short History of Medicine* (Baltimore, Md.: Johns Hopkins University Press, 1982), p. 163.

75. J. B. Morrell has pointed out how productive such research methods could be. "The Chemist Breeders: The Research Schools of Liebig and Thomas Thomson," *Ambix,* 1972, *19*:1–46.

76. Conklin, "Biographical Memoir," p. 234.

77. Greenman was probably Jewish, Hatai was Japanese, King was female, and Donaldson was permanently disabled by tuberculosis in the 1890s. It is interesting that this socially marginal group — given the sensibilities of the early twentieth century — sought to make their institute the "center" of academic anatomy and biology.

influence.[78] A particularly striking example is the institute's special relationship with Japan, nurtured by Greenman and Hatai between 1915 and 1932, 22 Japanese scientists did research at the institute, comprising one third of all the visiting workers during this period.[79]

Members of the scientific staff were appointed individually by the board of managers to positions created specifically for each candidate. Professorships, associate professorships, instructorships, and fellowships were approximately equivalent in pay and security to similar positions at the University of Pennsylvania.[80] The board used its administrative power not only to control expenses but also to make certain that all scientific work conformed to the general program of the institute. In 1922, for example, Greenman told the board that Helen Dean King's work was good but not in line with the institute's program; the board then gave Greenman power to decide if her work should be allowed to continue.[81]

In 1907 Greenman attempted a shortcut to national prominence for the institute when he unveiled a plan to establish relations with the Marine Biological Laboratory in Woods Hole, Massachusetts. He envisioned "the union of both institutions and the development of a great national research institute."[82] At the next board meeting, Greenman's language became a bit more predatory: board members debated "the question of the practicability of acquiring and maintaining the Marine Biological Lab . . . ."[83] The possibility of such a merger ended because the board ultimately preferred plans that did not sacrifice the institute's independence.

In a new strategy "to promote the objects of the institute and establish it as a national central anatomical institute," Greenman began a program of publishing scientific papers.[84] By 1908 the institute controlled the circulation and administration of five journals, though it left editorial responsibility to the relevant academic

---

78. Greenman, "Wistar Institute of Anatomy and Biology," *Twentieth Anniversary,* p. 41.

79. Bonnie T. Clause, "Japanese Scientists and the Wistar Institute: The Early Years, 1906–1932," pamphlet published by the Wistar Institute, January 1988, Wistar Institute Archives.

80. The institute finally decided upon these names in 1912, although equivalent positions had existed since 1908. Board of Managers Minutes, Wistar Institute Archives, 19 December 1912.

81. King was not the only Wistar scientist chastised for pursuing "outside" research. Board of Managers Minutes, 16 February 1922.

82. Board of Managers Minutes, 7 October 1907.

83. Board of Managers Minutes, 17 February 1908.

84. Ibid.

organizations. The *Journal of Morphology,* for example, was founded by Charles O. Whitman in 1887 but was discontinued six years later for lack of funds. In 1908 Greenman revived the journal, obtained ownership, and eventually asked the American Society of Zoologists to appoint an editorial board.[85] The *Journal of Comparative Neurology* was founded in 1891 by C. L. Herrick; he remained editor and gave the institute rights, title, and interest in the journal. The editors and organizers of the *Journal of Comparative Zoology* leased the journal to the institute but retained ownership. The *Anatomical Record* and the *American Journal of Anatomy* were founded in 1901 to provide a vehicle for publishing work by American anatomists. The institute began publishing the journals in 1908, at first leasing and then owning them.[86]

Greenman more than doubled the distribution of American anatomical literature through a number of shrewd tactics. In addition to the common practice of making subscription to a journal part of membership dues to anatomical and zoological societies, the Wistar Institute also distributed thousands of dollars worth of free journals to research institutions around the world, to which many of them eventually subscribed. Greenman even realized the subtle appeal of providing abstracts in the native language of journal recipients even if they could speak English.[87] Receipts more than tripled from 1909 to 1924, and by 1924 the publishing program no longer ran a deficit (see Table II).[88]

The institute also benefited from World War I: with many European presses closed, scientists submitted a larger amount of

---

85. Edwin G. Conklin, a member of the Advisory Board, suggested reorganizing this journal. Letter from Greenman to Charles O. Whitman, 12 August 1907, Wistar Institute Archives.

86. Milton Greenman and G. Carl Huber, "The Journals of the Wistar Institute," *Twentieth Anniversary,* pp. 54–58. Greenman asked Horace Jayne to assume managerial and financial responsibility for publishing the journals; the institute relieved him of the responsibility in 1910. Letter from Jayne to Greenman, 17 February 1908, in Board of Managers Minutes, 17 February 1908.

87. Board of Managers Minutes, 9 February 1916; Greenman and Huber, "Journals," p. 62. In 1917 the institute began a bibliographical service, in which a library catalogue card and author's abstract for every paper appearing in the Wistar journals was distributed to libraries and research institutes throughout the world. This service provided instant publication and distribution of results and an accessible bibliography by subject. It also advertised the journals throughout the world: the cards were translated into French, German, Spanish, Italian, Japanese, and Chinese. Greenman and Huber, "Journals," p. 61.

88. Greenman, "Report to the President," 18 June 1924, pp. 31–33; Greenman and Huber, "Journals," pp. 3–67.

material than ever before to Wistar publications. Greenman urged publishing as much as finances would allow "in the interests of American science and in the interests of the Institute."[89] After the War, the institute sent many free copies of journals to Europe with the inscription:

> Presented to in the interests of science and for the promotion of international cooperation by The Wistar Institute of Anatomy and Biology, Philadelphia, PA U.S.A.[90]

The National Research Council and several private individuals helped defray the expenses of free distribution until the Rockefeller Foundation began covering the costs in 1922. The institute not only gained in reputation, but also collected income from orders for back issues.[91]

Greenman was able to extend the institute's research, publishing, and animal colony in part because of the generosity of Samuel S. Fels. The philanthropist donated money to pay for fellowships and guest researchers on a yearly basis. He also paid $45,000 for the new rat colony building in 1922.[92] Funds from Fels and other private contributors supplemented the income from Wistar's endowment and allowed Greenman to implement his plan to improve the institute's status in academic biology.

The Evolution of a Research Institute

Through its journal publication and research on the rat, the Wistar Institute became a center for American biology by 1925. As the work of obtaining and classifying specimens for the museum slowed, however, several members of the board of trustees questioned the shift in resources to research and publishing. Greenman stated in 1912 that it was time to appoint a curator and assistants to develop the museum as stipulated by the deeds of trust, yet in 1915 the board was still debating the best means of enhancing the museum collection.[93] In 1923 George Vaux, Jr., of the board of managers called attention to the small amount of money expended

89. Board of Managers Minutes, 2 December 1914.

90. "Director's Report," 1920, p. 19, Wistar Institute Archives.

91. Board of Managers Minutes, 21 October 1920, 17 February 1921, and 15 June 1922.

92. Board of Managers Minutes, 19 June 1918, 16 October 1918, 16 February 1922, and 15 June 1922.

93. Board of Managers Minutes, 19 December 1912 and 20 January 1915.

during 1923 on the library and museum.[94] This prompted a report from Greenman on the history of the institute to determine whether the conduct of the institute was following Wistar's wishes.

Greenman defended the institute's activities in part by quoting Wistar's tortuous legal prose. In 1902 the General stated in a letter to the future managers of the Wistar Institute:

> My chief and controlling intention [is] the best equipped, most perfect and complete museum in America of illustrative objects of normal and abnormal human and comparative anatomy, and I earnestly desire that no ambitious efforts to teach or publish, or any other collateral or side objects, however meritorious in themselves, shall ever be allowed to limit, restrict, dilute or in any manner interfere with that primary object, and the original research that is legitimately attracted by such a museum and is sure to grow with its increase.[95]

In the last clause, Wistar qualified his plan for the institute to include research connected to the museum. In the similarly complex language of the Settlement of the Trust, he appeared to give the board of managers the power to initiate work in both research and publishing.[96] In both cases, however, Wistar clearly assigned priority to developing the museum.

Greenman also noted that after the first meeting of the advisory board in 1905, Wistar was in favor of expansion along the lines recommended by this group of leading scientists.[97] He seemed to have changed his view about the function of the institute and wrote Greenman that "the Wistar Institute Museum should be designed for the use and study of investigators; rather than a mere gaping public."[98] Wistar was also no doubt aware of the importance that the newly founded Carnegie Institution of Washington and the Rockefeller Institute for Medical Research placed on scientific research, perhaps wondering about the ultimate status of his insti-

---

94. Board of Managers Minutes, 21 February 1924.

95. "A letter from Isaac J. Wistar to future officers and managers . . . ," p. 2.

96. "Settlement of the Trust, 1893," pp. 27 and 21.

97. Isaac Wistar still directed institute policy in 1905: he approved of the Advisory Board's recommendations and asked them to become permanent advisors. Greenman, "Report to the President," 18 June 1924, p. 27; Board of Managers Minutes, 18 April 1905, Wistar Institute Archives.

98. Letter from Wistar to Greenman, 19 February 1905, reprinted in Greenman, "Report to the President," 18 June 1924, p. 24.

tute.[99] Clearly he thought in 1905 that the institute should shift its museum focus to one incorporating research and responding to the needs of academic biology. Nevertheless Wistar died several months later without having changed the terms of the original deeds of trust.

The board decided unanimously in 1925 that the institute's work under Greenman conformed to Wistar's wishes as set forth in the deeds of trust and as interpreted verbally by Wistar to Greenman. They also argued that changes in biology required new policy directions to fulfill Wistar's goals:

> Scientific methods of research in biology and anatomy have been developed in the past twenty years along lines requiring constantly increasing emphasis to be laid upon procedures which were only in their infancy in General Wistar's lifetime. Anatomical specimens preserved in Museums constitute today only a part of the data which must now be studied in order to accomplish the ultimate object of the Institute as stated in the Trust Deeds.[100]

These statements echo Greenman's report to the board less than a year before: "It hardly seems necessary for me to remind you that anatomical investigations have passed from the stages of dissecting and observing dead animals to the experimental stage dealing with living forms in their various stages of growth."[101]

The shift in the institute's programs was not simply a discovery of experimental research. In 1905 Greenman reported the "principal object of the Institute to be research," but in 1896 his predecessor, Horace Jayne, had described the first object of the Institute as the "prosecution of original research in Biology . . . ."[102] The words were similar, but the meaning had changed. Jayne wrote that one of his assistants, J. MacPherson Stotsenburg, spent the summer of

---

99. Although there is no explicit evidence that Wistar was following the Carnegie and Rockefeller examples, the founding of the two new research institutions was widely discussed. Henry Donaldson, for example, referred to them when he wrote: "The events which have brought the endowment of research in special notice during the last decade are known to all." "Some Aspects of the Endowment of Research," *Science*, 23 February 1906, p. 283. Wistar was probably also aware that promising young scientists such as Simon Flexner were going to the Rockefeller Institute because they perceived a lack of opportunities to do research at the University of Pennsylvania. Kohler, *From Medical Chemistry to Biochemistry*, p. 119.

100. Board of Managers Minutes, 19 February 1925.

101. Greenman, "Report to the President," 18 June 1924, p. 33.

102. Greenman, "Report of the Director," *Provost's Report*, 1905, pp. 142–143; Jayne, "Report of the Director," 1896, p. 146.

1899 at the University of Pennsylvania Laboratory at Sea Isle City, where he "carried on extensive experiments in macerating and preparing skeletons, the practical results of which were several hundred valuable preparations."[103] The next summer Stotsenberg continued his experiments, one of which demonstrated that the larvae of several species of beetles could be used to clean skeletons. By "research" Jayne meant not only studies in species classification and comparative anatomy, but also the development through experimentation of new methods for preparing and displaying museum specimens. Thus Jayne felt he had succeeded as director when he reported that "in scientific publications the Wistar Institute is regarded as occupying a leading position in museum work."[104]

While Jayne directed research at the institute to develop the museum, Greenman sought to "establish research in [the] laboratories and make [the] museum subservient thereto." Thus he brought in Donaldson to direct a research program in neurophysiology, and he helped develop the rat colony because "any laboratory expecting to investigate the fundamental principles of biology must include among its supplies some living forms." Greenman also stressed the clinical relevance of new experimental methods: "Could we have discovered the effect of the thyroid apparatus on body growth by a study of museum specimens? Could we have learned the cause of Beriberi by a study of fatal cases of this disease?"[105]

Greenman's decision to shift research away from comparison and classification and toward investigation of biological processes reflected the interests of elite academic biologists — especially the anatomists who dominated the Wistar board of scientific advisors. Seven of the nine Wistar advisors were officers or members of the AAA.[106] The teaching of anatomy had long been a battleground, pitting surgeons interested in practical knowledge of anatomy

---

103. Jayne, "Report of the Director," 1899, p. 145.

104. Jayne, "Report of the Director," 1900, p. 124. Jayne's idea of research was fossilized in the 1880s when he taught in the University of Pennsylvania's school of biology, which was heavily influenced by the medical department to pursue comparative and pathological anatomy. Pauly, "Appearance of Academic Biology," pp. 390–391.

105. Greenman, "Report to the President," 18 June 1924, p. 34. Similarly, Greenman defended the institute's research room at the Marine Biological Laboratory because of the availability of lower marine forms, which are less complex expressions of the fundamental laws of life. Greenman, "Report of the Director," 1906, p. 188, and 1907, pp. 176–177.

106. Nearly all had studied in Germany and were professors at major American universities. Cattell, ed., *American Men of Science: A Biographical Dictionary.*

against the "new" anatomists interested in an experimental biology freed from its traditional association with surgery.[107] Arguing that structure was ultimately the expression and the basis of function, some American anatomists at the turn of the century began studying cytology, physiology, embryology, psychology, bacteriology, and biochemistry.[108] Lewellys F. Barker, for example, emphasized the correlation of structure and function and the shift to experimentation in his description of modern anatomy.[109] The advisory board's suggestion that the institute focus on research and abandon its museum function was consistent with their attempts to redefine anatomy as a modern experimental science.

In his desire to make the Wistar Institute the center of academic biology and anatomy, Greenman responded to what he perceived to be the primary needs of American science. He radically changed the research program, established the publishing function, and worked to make the institute a coordinating center for American anatomical research. Although Greenman wrote several papers on nerve regeneration in the rat, he spent almost all of his time promoting the institute locally and internationally and managing its various programs. His strength lay in his ability to sense important trends in academic biology and to mobilize the institute's resources along those lines.

At the twentieth anniversary celebration of the advisory board in 1925, Clarence E. McClung, professor of zoology and director of the zoological laboratory at the University of Pennsylvania, summarized the history of the institute:

> It started as a repository of a limited anatomical collection, because at the time the function of a museum was that of a conservator principally. As biology developed . . . the emphasis shifted to experimental studies, and the Institute embarked upon an intensive study of the vertebrate nervous system."[110]

What seemed so obvious in retrospect was far from obvious in 1905, though Greenman helped assure the success of his strategies

---

107. Nicholas A. Michels, "The American Association of Anatomists: A Sketch of its Origin, Aims, and Meetings," *Anatomical Record*, 1955, *122*:685–714.

108. Ibid., pp. 692–694.

109. Lewellys F. Barker, "The Relations to Medicine of Institutes of Anatomical Research," *Twentieth Anniversary*, pp. 80–83.

110. Clarence E. McClung, "Changes in Methods of Biological Research as Pursued by Museums and the Possibilities of the Future," *Twentieth Anniversary*, p. 70.

by consulting the elite cadre of academic anatomists whose opinions would determine the scientific reputation of the institute.[111] The evolution of the Wistar Institute reflected the ambition of its directors and the changing environment of anatomy and biology.

Epilogue

The Wistar Institute satisfied the spirit if not the explicit goals of Isaac Wistar: he was determined to honor the family name and in the 1890s was convinced that an anatomical museum was the appropriate form. After 1900 anatomical museums became much less prestigious than experimental research and the rapid distribution of its results, and Greenman chose the appropriate course in improving the institute's position in American biology. Thus the museum withered as the animal colony grew. It is ironic that Horace Jayne was replaced by Greenman, though Jayne had followed Wistar's original plan for a museum more closely.

In 1937 Edmund J. Farris became acting director of the institute, filling a void left by the deaths of both Greenman (1937) and Donaldson (1938). The institute's growth slowed under Farris, who resurrected the plan for the museum "as textbook chapters for the teaching value." Farris also reversed Greenman's strategy of concentrating resources on narrowly focused research programs and instead encouraged diversification in anatomy, cytology, chemistry, and microbiology.[112]

The present director, Dr. Hilary Koprowski, has led the institute into a new era of prosperity beginning in 1957. He has greatly increased the scientific staff and the budget, largely through grants from the federal and state governments and private foundations (see Table III). Koprowski also shifted the programmatic focus to basic biomedical research relevant to viral, degenerative, and malignant diseases. Although the Wistar Press and the rights to the rat line have been sold, links with the past remain.[113] The institute

111. Greenman presented the Board of Managers with evidence of the success of his programs, including letters from Edwin G. Conklin, F. R. Lillie, and Charles Harrington, all of whom praised the institute for its work after 1905. Greenman, "Report to the President," 18 June 1924, pp. 35–38.

112. Edmund J. Farris, untitled report to the Board of Managers, circa 1953, Wistar Institute Archives.

113. The Wistar Institute stopped supplying rats to other laboratories in 1960, when the breeding stocks were sold to a commercial firm. Lindsey, "The Laboratory Rat," p. 11.

has developed a number of research cell lines that are used by laboratories throughout the world — a program paralleling its work with the Wistar rat. The museum is open to the public, but the exhibits are being moved to make room for additional laboratory space. The Wistar Institute thus prepares to enter yet another stage in the development of a research institute as it adapts to a changing intellectual and social environment.

Acknowledgments

I am indebted to Bonnie Clause of the Wistar Institute, who guided me through the "Wistar Archives" and read several versions of this paper. Many of my colleagues at the University of Pennsylvania contributed in a variety of ways — Alex Pang, for example, suggested the title. My greatest debt is to my advisor, Charles E. Rosenberg, for helping me learn how to be an historian.

TABLE I

HENRY DONALDSON'S STUDY OF THE ALBINO RAT

1. Determined growth curves for body length and body weight
2. Correlated growth curves of brain and cord with body length and weight
3. Studied various conditions which might affect the nervous system:
    a. Domestication, age, exercise, inbreeding (H. D. King)
    b. Gonadectomy (J. M. Stotsenberg and S. Hatai)
    c. Growth of cerebral (N. Sugita) and cerebellar (W. H. F. Addison) cortex
    d. Blood supply to different portions of the brain (E. H. Craigie)
    e. Chemistry of the brain solids (W. and M. L. Koch)
    f. Relation of size of nerve cells to length of their neurites, the spacing of nodes in nerve fibers (S. Hatai)
    g. Regeneration of nerve fibers (M. J. Greenman)
4. Growth curves:
    a. Skull
    b. Skeleton
    c. Viscera (S. Hatai)
    d. Individual organs, the submaxillary glands, the hypophysis (W. H. F. Addison)
    e. Thymus, adrenals (J. C. Donaldson)
    f. Thyroid and effects of thyroidectomy (F. S. Hammett)

NOTE: The names of Donaldson's collaborators are given in parenthesis. This outline was adapted by J. Russell Lindsey from a summary of Donaldson's life work by J. P. McMurrich and C. M. Jackson, "Henry Herbert Donaldson, (1857–1938)," *Journal of Comparative Neurology,* 1938, *69*:173–179. It appears in J. Russell Lindsey, "The Laboratory Rat," in Henry J. Baker, J. Russell Lindsey, and Steven W. Weisbroth, editors, *Biology and Diseases,* vol. I (New York: Academic Press, 1979), p. 5.

TABLE II

COST OF JOURNALS

	Original Data			Adjusted for Inflation			
year	*cost*	*income*	*deficit*	*cost*	*income*	*deficit*	*index*
1908	12,458	6,314	6,254	10,296	5,218	5,169	121
1909	18,416	13,804	4,612	15,220	11,408	3,812	121
1910	24,663	19,579	5,084	19,268	15,296	3,972	128
1911	24,317	18,170	6,147	18,422	13,765	4,657	132
1912	24,937	17,581	7,356	18,750	13,219	5,531	133
1913	20,885	15,961	4,924	15,245	11,650	3,594	137
1914	19,703	13,692	6,011	14,175	9,850	4,324	139
1915	20,216	15,809	4,407	14,865	11,624	3,240	136
1916	25,338	24,308	1,030	17,005	16,314	691	149
1917	32,927	29,998	2,929	18,395	16,759	1,636	179
1918	30,357	24,323	6,034	13,925	11,157	2,768	218
1919	28,943	24,366	4,577	11,718	9,865	1,853	247
1920	41,500	36,922	4,578	14,510	12,910	1,601	286
1921	45,375	33,968	11,407	18,445	13,808	4,637	246
1922	38,628	26,860	11,768	16,868	11,729	5,139	229
1923	36,942	33,134	3,808	15,787	14,160	1,627	234
1924	50,110	50,692	(582)	21,415	21,663	(249)	234

NOTE: The table of journal costs is from Milton Greenman and G. Carl Huber, "The Journals of the Wistar Institute," *Twentieth Anniversary of the Organization of the Advisory Board of the Wistar Institute of Anatomy and Biology,* 13 April 1925, p. 67, Wistar Institute Archives. The index used to correct for inflation is from Douglas, "Cost of Living Indexes," in *U.S. Bureau of the Census, Historical Statistics of the United States, Colonial Times to 1970, Bicentennial Edition, Part I* (Washington, D.C.: GPO, 1975), p. 212. (1898 = 100) Note that after adjusting the original data for inflation, there is little gain in income except in 1924.

TABLE III

SCIENTIFIC STAFF, VISITING SCIENTISTS, AND TRAINEES AT THE WISTAR INSTITUTE 1937–1990

	Scientific Staff*	Visiting & Associate Scientists	Predoctoral Trainees	Postdoctoral Trainees & Fellows
1937	8	8	—	—
1947	6	24	—	—
1956	11	6		
1958–1959	20	15		
1966–1967	30	23	19	9
1977	59	23	26	15
1987	81	23	34	38
1990	84	47	33	88

NOTE: Data based on staff lists in the Wistar Institute's Director Reports, Board of Managers Minutes, and various annual and biennial reports. Note the dramatic increase in the number of investigators since Hilary Koprowski was named director in 1957.
* Doctoral-level personnel with staff appointments.

University of Pennsylvania
Department of History and
Sociology of Science
215 South 34th Street
Philadelphia PA 19104

Wax Models in Dermatology

LAWRENCE CHARLES PARISH
GRETCHEN WORDEN
JOSEPH A. WITKOWSKI
ALBRECHT SCHOLZ
DANIEL H. PARISH

Wax models are among the most striking of art forms. Whether the wax has been made into a death mask to immortalize a famous person, transformed into a sculpture or votive offering, molded into exquisite jewelry to adorn royalty, used as the first phase of a piece of art, or created as a medical moulage, the work will be true to life or exact in detail. This is the magnificence of wax models in dermatology: life-like textures and colors of the skin in the models create a realism that in a sense challenges that of the actual human body.[1]

Moulages were introduced in Europe for the teaching of anatomy shortly after the Renaissance. The preservation of material and the introduction of wax injection techniques stimulated the development of anatomical museums comprised of the newly created wax models.[2] With the development of medical education in the eighteenth century, the demand for actual teaching specimens in anatomy far outstripped the available material. Wax models proved not only a useful means for demonstrating anatomical points but were also less perishable and odiferous than actual specimens.[3]

---

1. Benedetto Lanza, *La Cereoplastica nella Scienza e nell'Arte atti del I Congresso Internazionale* (Florence, Italy: Leo S. Olschki, 1977); Anita Leslie and Pauline Chapman, *Madame Tussaud: Waxworker Extraordinary* (London: Hutchinson & Company, 1978); Harvey Cushing, "Ercole Lelli and His Écorché," *Yale Journal of Biology and Medicine*, 1937, *9*:199–213.

2. T. Martini, "Egisto Tortori e l'Arte di Modellare in Cera," *Rassegna Nazion*, 1895, *82*:484–500. These collections, such as Frederick Ruysch's in Amsterdam, attracted such popular attention that they were often bought by nobility, usually, as in the case of Tsar Peter the Great of Russia, for aesthetic rather than didactic purposes. Kenneth F. Russell, "Ivory Anatomical Manikins," *Medical History*, 1972, *16*:131–142.

3. For the case of the Londoner Abraham Chovet, who brought an outstanding anatomical collection to Philadelphia, see Claire E. Fox and Saretta Berlin, "Abraham Chovet (1704–1790): 'The Perfect Original'," *Transactions & Studies of the College of Physicians of Philadelphia*, 1971, 4th ser., *38*:221–230. The models were often placed in museums which showed both wet specimens, when available, and the dry

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 29-74
© 1991 by The College of Physicians of Philadelphia.

In the nineteenth century dermatology began to emerge as an independent specialty, and from the beginning the value of artistic and realistic representations of disease was recognized. Jean Alibert in Paris and Robert Willan in London both used painted illustrations in their pioneering works on dermatology to convey images of skin disease. During this time, atlases of pathological findings of the skin appeared. Descriptions and classifications of skin diseases were becoming more detailed and often increasingly complex.[4] Sometimes, words simply could not convey as vividly what a wax model might reveal. Thus, the dermatology museum was born.[5]

Early Modelers

Of the many modelers who created anatomical and pathological moulages,[6] four emerge as being particularly prominent in the development of dermatological models.[7] Franz Heinrich Martens (1778–1805) is the earliest of the group. Although none of this German physician's work is extant, he seems to have created about 30 moulages relating to venereal disease while at the University of Jena.[8] Martens's work was subsequently recognized by Johann Wolfgang von Goethe, the great German writer, poet, and scientist, who had become enamored of wax models. In 1832, he wrote to a

---

mounts. Rumy Hilloowala and Joseph Renahan, "XVIII-Century Anatomical Models at La Specola, Florence," *Anatomischer Anzeiger (Jena)*, 1985, *159*:141–158. For a more detailed account of these collections, see our previous publication, Thomas N. Haviland and Lawrence Charles Parish, "A Brief Account of the Use of Wax Models in the Study of Medicine," *Journal of the History of Medicine and Allied Sciences*, 1970, *25*:52–75.

4. John Thorne Crissey and Lawrence Charles Parish, *The Dermatology and Syphilology of the Nineteenth Century* (New York: Praeger Scientific, 1981); Robert Jackson, "Historical Outline of Attempts to Classify Skin Diseases," *Canadian Medical Association Journal*, 1977, *116*:1165–1168; Franz Ehring, *Skin Diseases: Five Centuries of Scientific Illustration* (Stüttgart: Gustav Fischer-Verlag, 1989).

5. Frederic Griffith, "Joseph Towne, Wax Modeler of Guy's Hospital," *Medical Library and Historical Journal*, 1905, *3*:41–45.

6. E. J. Pyke, *A Biographical Dictionary of Wax Modelers* (Oxford: Clarendon Press, 1973); *Supplement* (Private Printing, 1981); *Supplement II*, (Private Printing, 1983); *Supplement III* (Private Printing, 1986).

7. Thomas Schnalke, "A Brief History of the Dermatologic Moulage in Europe: Part 1. The Origin," *International Journal of Dermatology*, 1988, *27*:134–139.

8. K. Von Bardeleben, "Franz Heinrich Martens, In Memoriam," *Deutsche Medizinische Wochenschrift*, 1896, *22*:762–763.

Figure 1. Wax models created by Joseph Towne, and now on display in Guy's Hospital, London, England.

Prussian government official advising the city of Berlin to send students to Florence to master moulage making techniques.[9]

Joseph Towne (1808–1879), who spent his entire career at Guy's Hospital in London, is perhaps the most famous of the dermatological moulagers. A protégé of the Victorian surgeon John Hilton, Towne first made anatomical models from Hilton's anatomical dissections. Sometime later, he came under the direction of Thomas Addison and produced his first dermatological models. From then on, he turned his attention to skin disease, creating approximately 560 moulages depicting various dermatitides and sexually transmitted diseases (see Fig. 1). He never sold his models in England, but he did allow sales of his work abroad, mostly to the United States.[10]

Jules Pierre François Baretta (1834–1923) began his career in Paris making papier-maché replicas of fruit. When the original modeler engaged by the Hôpital Saint-Louis left Paris for America

---

9. Thomas Schnalke, "Johann Wolfgang von Goethe — der erste Förderer Dermato-Venerologischer Moulagenkunst," *Dermatologische Monatsschrift,* 1987, *173*:348–352.

10. David J. Atherton, "Joseph Towne: Wax Modeler Extraordinary," *Journal of the American Academy of Dermatology,* 1980, *3*:311–316; Griffith, "Joseph Towne."

in 1863, Charles Lailler, the head of the new dermatological museum at the hospital, hired Baretta, and within a few years he had become one of the most talented and famous moulagers in Europe. Baretta created his first moulage in 1865, and before he died, he had sculpted about two thousand models. His creations were renowned for their extraordinary detail. Baretta's fame spread everywhere, for he was able to capture the natural evolution of skin disease, even if it required the use of serial models.[11]

Anton Elfinger (1821–1864) attended medical school in Vienna but devoted his professional career to creating water colors of dermatological conditions for Ferdinand von Hebra, the pioneer Austrian dermatologist. Elfinger made many moulages, several of which remain extant in Vienna. His work can often be identified by the mark "Cjt," probably used in memory of Cajetan Julius Zumbo (Gaetano Giulio Zumbo) (1656–1701),[12] an eminent Italian anatomical modeler whom Elfinger idolized.[13]

Techniques

How the models were made and whether they were even made of wax often remain mysteries. Both Towne and Baretta, for example, refused to reveal their methods or to teach them to prospective students.[14] Towne apparently used beeswax and shaped his moulages simply with a chisel, a few spatulas, and a knife-like instrument.[15] Baretta, it seems, began with a plaster mold in which he cast his model in a mixture of beeswax and resin, possibly gutta-percha, and heated to two hundred degrees celsius. These methods would appear to be variations on earlier techniques created by Zumbo and Guillaume Desnoues in the sixteenth and seventeenth centuries.[16]

---

11. Georges Solente, "Le Musée de l'Hôpital Saint-Louis," *American Journal of Dermatopathology,* 1983, *5*:483–489.

12. F. Cagnetta, "Gaetano Zumbo," *FMR,* April 1989, *8*:84–92; Paolo Giansiracusa, *Gaetano Giulio Zumbo* (Siracusa: Fabbri Editori, 1989).

13. Angelo Bellini, "La Modellazaione in Cera della Malattie Cutanee," *Giornale Italiano di Dermatologia e Venereologia,* 1908, *43*:722–731. Manfred Skopec, "Anton Elfinger (1821–1864) — A Forgotten Medical Illustrator," *International Journal of Dermatology,* 1983, *22*:256–259; Karl Portele, "Dr. Med. Anton Elfinger, ein Vergessener Medizinischer Modelleur," *Ann. Naturohistor. Mus. Wien.,* 1974, *78*:95–102.

14. Bellini, "La Modellazaione."

15. Skopec, "Anton Elfinger."

16. Luigi Belloni, "Anatomia Plastica," *Ciba Symposium,* 1959, *7*:229–233.

A graphic account of how to create a dermatological wax model is given by the famous Philadelphia dermatologist Jay Frank Schamberg and his colleague James Frank Wallis, later of the Army Medical Museum in Washington.

> The first step in the making of a wax model is the preparation of the mould or cast. This is made of plaster-of-Paris of which the variety used by dentists is the best. The skin is to be prepared for the reception of the plaster by painting it with olive oil. Where-ever [sic] hair is present, as upon the eyebrows and the moustache, this must be carefully anointed with a stiff ointment, such as resin cerate. The imprisonment of the hair in the plaster is a most painful and embarrassing accident. If the eyelashes are well greased with vaseline, they, as a rule, give no trouble. The eyelids should be kept well shut, in order to keep out the irritating particles of plaster. One may cover the eyelashes and palpebral cleft with moistened rice-paper (ordinary cigarette paper), and in this manner seal the conjunctival sac. It is necessary to limit the spread of the plaster in applying it to the skin. This is best accomplished by laying wet towels about the proposed boundaries of the parts. The plaster is sprinkled in handfuls or through a sieve into a basin of water until the latter absorbs no more plaster. After the plaster is entirely submerged, and not until then, the mass is stirred. The stirring should be carefully continued until the plaster acquires a creamy consistence. It is then rapidly poured upon the skin, care being taken to bring it in contact with the entire surface while yet fluid, in order that it may insinuate itself into all of the depressions of the skin. It is then built up to a desirable degree of thickness and allowed to set. The setting is indicated by the development of warmth. This ordinarily takes from five to eight to ten minutes, depending upon the consistence of the original plaster mass and the temperature of the water. The cast is then removed.
>
> . . . . . The wax composition employed is as follows:
>
> White wax, 1 part; yellow wax, 2 parts; paraffin (about 54°C. melting-point), 1 part; starch, 2 parts, talcum, 3 parts.[17]

Numerous variations of methods such as this have been employed

---

17. Jay Frank Schamberg and James Frank Wallis, "Wax Models — Their Preparations and Uses," *University of Pennsylvania Medical Bulletin,* 1901, *14*:262–264.

up until the present day.[18] Another method of moulage making, described in 1969, is the Agar Formula.[19]

Agar Formula

Water	1770 cc	Oxyquinoline sulfite	2 gm
Agar	120 gm	Paraffin	2.5 gm
Borax	25 gm	Soap (plain white)	2 gm
Zinc Oxide	25 gm	Cellucotton	3 gm
Talc	50 gm	Cotton	0.5 gm

Mix all ingredients until completely homogeneous and allow to cool to a point slightly above body temperature. Apply to skin to a thickness of about three-eighths of an inch. No previous preparation of the skin is required. The mold can be reinforced with a top coating of plaster of Paris. Remove slowly when dry. To make a positive model from the above negative impression, no preparation of the surface of the mold is needed. The following wax formula can be used to prepare the moulage.

Paraffin (52°)	400 gm
Colophony (W.W.)	500 gm
Carnuba Wax (light)	100 gm

(adapted from C. C. Clarke, "Rubber Moulages for First Aid Training," *Journal of Technical Methods,* 1945, *25*:91–101.)

The wax mixture is melted and either painted onto or poured into the agar mold. To reinforce the moulage, layers of gauze bandage can be placed between coatings of wax.

In more recent years, models had been prepared at the Jersey City Medical Center, the Baretta Studios in Paris,[20] and the Mayo Clinic. These productions have now ceased.

---

18. Hortense P. A. Douglas, "The Reproduction of Pathological Specimens by the Use of the Wax Moulage," *Journal of Technical Methods and Bulletin of the International Association of Medical Museums,* 1929, *12*:52–55; Felix Traugott and Alvin Shemesh, "A Wax Moulage Technique," *Medical and Biological Illustration,* 1954, *4*:31–38; Marion A. Wilcox and Gertrude H. Nicholson, "A Method for Making Accurate Medical Moulages," *Medical and Biological Illustration,* 1970, *20*:91–94; William H. Woller, Michael Bordovsky, and Robert E. Lyons, "A Simplified Technique for Casting Anatomical Models," *International Journal of Dermatology,* 1977, *16*:214–217; Elsbeth Stoiber, "Zur Technik der Interpretation Ästhetisch Störender," *Krankheiten, Parfümerie und Kosmetik,* 1956, *37*:428–430; G. Thomas Photinos, "Die Herstellung und Bedeutung der Moulagen (farbige Wachsabdrücke)," *Dermatol. Zeitschrift,* 1907, *4*:131–157.

19. David M. Cohen, "Moulage — A Unique Blend of Art and Science," Exhibit at the American Academy of Dermatology, Miami Beach, Florida, 6–11 December 1969.

20. Ibid.

Except for the German Hygiene Museum in Dresden, no dermatological models are being made currently. Elsbeth Stoiber (1926–), originally from Stüttgart, now of Zürich, may be the last of the dermatological modelers in an academic department, having retired in 1986 from the University of Zürich.

Displays

Traditionally, models have been displayed on table tops and covered with bell jars. We think this has resulted only due to the availability of the jars in museums. Sometimes, the models have been mounted in groups on walls against black backgrounds. Occasionally, the models have also been protected by glass. Although the mountings themselves have often been done in white muslin, James Frank Wallis suggested an alternative mount. Linen strips are embedded in the molten wax so that they cannot be pulled through. This allows the model to be attached to the base through slits cut in it.[21]

Exhibits

Following the First International Congress of Dermatology in Paris, in August 1889, exhibitions of dermatological models became quite popular at major meetings. As the sessions of this Congress were held in the museum of the Hôpital Saint-Louis, the 250 registrants had ample opportunity to view the moulages.[22] For the first time many participants saw how graphic these moulages were. This congress display triggered the rapid development of dermatological models in Central Europe. Wax models were subsequently exhibited at many other congresses (see Fig. 2).[23] In recent years, exhibits of wax models have usually been prepared more for historical purposes.[24]

---

21. R. W. Shufeldt, "The Wax-modeling Department of the Army Medical Museum of the Surgeon-General's Office, and the Application of the Art to General Medicine," *Medical Record,* 1918, *94*:663–668.

22. Henry E. Michelson, "Eleven International Congresses of Dermatology," *Archives of Dermatology,* 1962, *86*:2–15.

23. For example, at the VII International Congress of Dermatology, 8–13 April 1912, Rome, G. Thomas Photinos of Greece demonstrated the effectiveness of salvarsan therapy with 24 moulages. See John D. Stratigos, *Selected Pieces of the Museum of Moulages of "Andreas Sygros" Hospital* (Athens, Greece: Private Printing, 1987), pp. 1–56.

24. At the 1971 American Academy of Dermatology Meeting, an exhibit of 24 models from the Duhring Collection of the University of Pennsylvania was shown:

Figure 2. Exhibition of wax models at the Congress of the Society for Dermatology of the German Democratic Republic, Leipzig, Germany, 29 February–2 March 1984.

Lawrence Charles Parish and Max B. Rubin, "What's Your Diagnosis?" Exhibit at the American Academy of Dermatology, Chicago, 4–9 December 1971. The models from the department of dermatology in Dresden were exhibited at the German Democratic Republic Congress of Dermatology in Leipzig 29 February–2 March 1984: Heinz-Egon Kleine-Natrop, Albrecht Scholz, and Günter Sebastian, "Moulagen aus Dresden," exhibit at VIII Kongress der Gesellschaft für Dermatologie der DDR, Leipzig, 29 February–2 March 1984. These models were displayed again on 25–28 May 1988: Albrecht Scholz and Günter Sebastian, "Moulagen von Beinleiden," 10 Jahre Sektion Phlebologie der Dermatologischen Gesellschaft der DDR, Dresden, 25–28 May 1988. From 25–29 September 1989, they were shown at the 10th World Congress of Phlebology, held in Strasbourg, France: Albrecht Scholz and Günter Sebastian, "Moulages des maladies de jambes," 10ème Congrès Mondiale de l'Union Internationale de Phlebologie, Strasbourg, France, 25–29 September 1989.

An extensive exhibition was also prepared for the XVII World Congress of Dermatology held 24–29 May 1987, in West Berlin, Germany. This exhibition, at the urging of the president, Günter Stüttgen, was comprised of models from Athens, Zürich, and several German cities including Bonn, Freiburg, Hamburg, and Kiel: Ellen Sundhaussen, Günter W. Korting, and Constantin E. Orfanos, *Moulages* (Berlin, Germany: Diesbach, 1987). At the VI World Congress of the International Society of Dermatology: Tropical, Geographic, and Ecologic held in Rio de Janeiro, Brazil, 29 April–3 May 1989, an exhibition was shown of the models from the dermatology hospital in Guarujá, Brazil.

Collections in North America

Boston, Massachusetts. The first dermatological model arrived in the United States on 11 August 1783. A wax moulage of piebaldness in a young black girl was sent to Boston from the Caribbean Island of Martinique. The so-called moulage of Magdeleine was exhibited at the Harvard Medical School. In 1847 the Warren Anatomical Museum was founded.[25] In that year George Hayward, professor of surgery and clinical surgery at Harvard, presented to the museum 160 wax models made by F. Thibert. These were then displayed along with papier-maché models created by Auzoux of Paris. The collection of moulages at the museum later increased to two hundred and sixty-eight.[26]

Further additions to the collections were made by Edward Wigglesworth. After receiving his M.D. at Harvard in 1865, he spent the next five years studying dermatology in London, Berlin, and Paris. At the Hôpital Saint-Louis, he became enamored of Baretta's moulages. When he returned to Boston in 1870, he brought back copies of a large number of them. These copies of the moulages in the Paris collection formed the core of the dermatological museum at Harvard.

A contemporary account of the models revealed:

> The collection was purchased by Dr. Wigglesworth, and consists of many beautiful representations of disease from the hand of the well-known artist, M. Baretta. There are one hundred and seventy-nine models; of these one hundred and thirty-four portray non-syphilitic and forty-five syphilitic diseases of the skin. Among the rarer affectations, four examples of peculiar forms of scrofuloderma, six of lupus, three of lymphangitis, one of pityriasis rubra, and one of that most little understood disease called by the French mycosis fungoide, may be noted.[27]

The wax models seem to have been put to teaching purposes very shortly thereafter. Beginning in 1871 and continuing for 31 years, James Clarke White, the first professor of dermatology at Harvard, and for that matter, in the United States, gave a weekly afternoon

---

25. George E. Gifford, "Magdeleine of Martinique," *International Journal of Dermatology,* 1980, *19*:107–110.

26. John Barnard Swett Jackson, *A Descriptive Catalogue of the Warren Anatomical Museum* (Boston, Mass.: A. William, 1870).

27. Louis A. Duhring, "The Foundation of American Dermatology," *Archives of Dermatology,* 1880, 6:400–427.

lecture illustrated by photographs, specimens, and of course, wax models.[28]

Wigglesworth presented the title for the moulages to Harvard in 1873, but he personally continued to add to the collection for many more years. Louis A. Duhring, first professor of dermatology at the University of Pennsylvania, apparently selected models for his colleague during Duhring's long tours of Europe.[29] The collection no longer exists.

At some point, all the models were merged into the Warren Anatomical Museum. Unfortunately, the museum later needed space, and the models were placed in a basement storeroom in an area too close to the boilers. The tragic result was the reduction of the entire collection to an amorphous mass of wax.[30]

Chicago, Illinois. Whether dermatological wax models were available in Chicago in the early part of the twentieth century is not known. When Maurice (Moritz) Oppenheim was forced to leave Vienna in 1938, he brought with him many wax models from his department at the Wilhelminen Hospital. He soon became chairman of dermatology at the Chicago Medical School, where the models were housed. They were proudly used for teaching the medical students. Sometime after they were exhibited at the 1969 American Academy of Dermatology meeting in Bal Harbour, Florida, the models disappeared. Their exact whereabouts remains a mystery.[31]

Columbus, Ohio. Eleven models depicting primary syphilis, gonorrhea, and chancroid are in the Health Sciences Library at Ohio State University. No information is available about their origin.[32]

New Orleans, Louisiana. As early as 1850, the Louisiana State Legislature authorized funds for the purchase of wax models for the Medical College of Louisiana, the predecessor of Tulane University School of Medicine. The collection grew quickly in stature. By the early twentieth century, the catalogue of the medical department boasted: "The means for illustrating the didactic lectures consist of

---

28. Henry Knowles Beecher and Mark D. Altschule, *Medicine at Harvard: The First 300 Years* (Hanover, N.H.: University Press of New England, 1977), pp. 126–128.

29. Jules Baretta, *Catalogue des Moulages Coloriés* (Montévrain, France: L'Ecole d'Alembert, 1900); markings made by Louis A. Duhring.

30. Gifford, "Magdeleine of Martinique," and personal communication to authors, 1978.

31. Marshall A. Falk, personal communication to authors, 1989.

32. B. Van Brimmer, personal communication to authors, 1989.

numerous models in wax, papier maché, plaster and wood, of rare and beautiful workmanship, executed in London, Paris, and Florence." How many of these related to dermatology is not known; however, this becomes a moot point. In 1963 this collection also vanished, and no wax models appear to be extant at Tulane today.[33]

New York City, New York. Little is known about the models in this city. William Gottheil, professor of dermatology at the now defunct Fordham University School of Medicine made models, some of which can be seen at the National Museum of Health and Medicine in Washington, D.C. His belief in the significance of models is evident from his statement in 1902:

> Having done work of this kind myself, I am in a position to appreciate the very great amount of patience and skill that is required to make these models. Nothing in the way of a photograph or painting, and still less of anything in the way of verbal description, can approach it as a means of recording skin lesions. It is not possible, however, for a practitioner to devote to it the time that is required; and until we have some one like Baretta of Paris here, it can only serve as an occasional means of record in the hands of younger, and artistically inclined dermatologists. Years ago, when I made my models, I was invariably asked by some one when exhibiting them what they were worth. I always answered that it was a labor of love, and that hundreds of dollars would not pay me to make one. I am the more sorry to see that some of those here exhibited have been broken in transport, and would suggest that they are entirely too valuable to be carried about.[34]

A collection also seems to have been displayed at Bellevue Hospital, organized in part by James Wood, a prominent nineteenth-century surgeon.[35]

Philadelphia, Pennsylvania. Dermatological models in Philadelphia had their inception about 1850, when George Bacon Wood, professor of medicine at the University of Pennsylvania visited the important European medical centers. During one of these trips, he decided that the University of Pennsylvania School of Medicine should have a museum. He returned to Philadelphia with several

---

33. Rumy Hilloowala and C. H. Goldstein, "Waxes and Wedderburn: Tulane Anatomy in the Nineteenth Century," *Tulane Medicine,* 1981, *14*:9–10.

34. James Frank Wallis, "Wax Models of Unusual Types of Skin Diseases," *Transactions of the Section on Cutaneous Medicine and Surgery of the American Medical Association,* 1902, pp. 183–188.

35. Page Cooper, *The Bellevue Story* (New York: Crowell, 1948), pp. 54–57.

Figure 3. Erosion of the entire nose due to tertiary syphilis, by Joseph Towne, London, circa 1850. From the pathology department, University of Pennsylvania, on deposit in the Mütter Museum, College of Physicians of Philadelphia, 1986.
Photo by L. Cathryne Foedisch.

models, some of which were done by Joseph Towne (see Fig. 3). Eventually, he amassed 230 moulages that depicted such diseases as Addison's keloid and leprosy.

Next, Henry H. Smith, professor of surgery at the University of Pennsylvania until 1871, purchased approximately 70 models of cutaneous diseases and syphilis. He used these in the surgery department before dermatology was specifically taught at the Uni-

versity of Pennsylvania.[36] Later, some of the Wood and Smith collections were kept on display in the museum of the department of pathology. When the museum was disbanded in 1986, the models were placed on deposit at the Mütter Museum, College of Physicians of Philadelphia.

The mainstay of the dermatological collection began with Louis A. Duhring's grand tour of London, Paris, and Vienna. In 1870, he published a letter from Paris to the Philadelphia medical community about the Baretta models: "This is the most complete and beautiful set of models of these affections in the world."[37] Over the next four decades, he amassed a highly prized dermatological museum, mostly of Baretta and Towne models. He often relabelled and re-catalogued them, noting that in Paris: "The museum models are not properly arranged according to diseases in all instances, thus, the Lupus pernio is not with the other Lupus pernio but with tuberculosis."[38]

Duhring very much treasured his models and wanted them to be available for future generations of students of dermatology at the University of Pennsylvania. In a 1905 draft of his will, he wrote:

> It is the intention of the writer to make over to the University, a collection of wax models recently purchased abroad, and also a large valuable collection of portraits, plates, etc. The future preservation of these from dust, atmospheric, and other injurious agencies is a matter of importance. This care should devolve as a prescribed and binding duty upon the Professor of Dermatology in conjunction with the Professor of Pathology or other professors or officers, whose duty it would be to see to the care and preservation of the models and specimens in general in the Museum. Labor and time of this kind is not likely to be bestowed by the Professor of Dermatology unless provision thereof on the part of the Trustees is made prior to the election of the officer. . . .[39]

The Duhring collection, as it became known, included some dermatological moulages from the Wood and Smith collections.

---

36. Louis A. Duhring, *Rise of American Dermatology* (New York: A. G. Sherwood, 1880).

37. Louis A. Duhring, "Letter from Paris," *Medical Times,* 1870, *1*:82–84.

38. "Catalogue de l'Hôpital Saint-Louis," personal copy of Louis A. Duhring, deposited in the Library of the College of Physicians of Philadelphia by Frederick D. Weidman.

39. Draft of the will in the possession of the chairman of the department of dermatology, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania. A later version is found in Reuben Friedman, *A History of Dermatology in Philadelphia* (Fort Pierce Beach, Fla.: Froben Press, 1955), pp. 245–246.

Later professors of dermatology at the University of Pennsylvania lost interest in the models. Many were eventually relegated to storage, though subsequent to the exhibit of 1971 several restored models were kept on display, and currently remain on display, in the department of dermatology.

In 1985, the building in which the models were stored was sold, and the models were acquired by an auctioneer. Of these models, 29 were purchased the next year by the College of Physicians of Philadelphia through the History of Dermatology Collection Fund. An additional 10 were acquired by the Smithsonian Institution; 10 by the Wellcome Museum for the History of Medicine, in London, England; 30 by Tesseract, a scientific and medical instrument dealer; and two or three by private collectors.

The College of Physicians of Philadelphia possesses a collection of wax models in its Mütter Museum. The first dermatological wax model to have become part of the Mütter Museum is still, without a doubt, the most impressive. Part of the collection of Thomas Dent Mütter, third chairman of the department of surgery at the Jefferson Medical College, it is the face of a woman with a six-inch cutaneous horn projecting in a downward curve from her forehead to the level of her chin. It was probably acquired between 1841 and 1856, when Mütter was actively assembling the collection of specimens and models which he used in teaching at Jefferson, and which were presented by him to the College in 1858 (see Fig. 4).

In 1868, the museum completed negotiations begun the previous year with Julien Ledion of New York and purchased 80 wax models. In a letter to Thomas Hewson Bache, a Fellow of the College, on 27 March 1868, Ledion informed the museum that the dermatological and syphilitic moulages came from the Hôpital Saint-Louis in Paris. Additional models in the collection depicting syphilis appear to have been made at the Hôpital des Vénériens in Paris from patients on the service of Philippe Ricord, the famous syphilologist.

Conflicting information now occurs. Duhring, in his presidential address given at the American Dermatological Association at Newport, Rhode Island, on 31 August 1880, claimed that the museum had acquired a collection of 130 dermatological and venereological models in 1868.[40] An undated manuscript listing 130 dermatological wax models, made by Baretta of Paris and offered

40. Duhring, *Rise of American Dermatology.*

Figure 4. Face with horn-like tumor (Cornu Cutaneum), by unknown artist, pre-1856. From the original collection of Dr. Thomas Dent Mütter, Mütter Museum, College of Physicians of Philadelphia.

for sale by the museum of the Hôpital Saint-Louis is bound in a collection of printed catalogues in the Library of the College of Physicians of Philadelphia.[41] Museum records do not account for the discrepancy in numbers of models said to be in the collection at that time. In 1870, five additional models were purchased from Ledion. These included moulages of melanotic diseases. One moulage is extant and shows melanotic sarcoma of the larynx and trachea. Later museum correspondence indicates the purchase of 64 dermatological models made by Baretta at the Hôpital Saint-Louis.

In 1909, the College moved from 13th and Locust Streets to its present building at 22nd and Ludlow Streets. The museum took this opportunity to cull its collections. A Museum Committee Report for that year states: "the wax preparations of venereal conditions were given to the teacher of that subject at the Jefferson Medical College." These models were displayed for many years in the Jefferson Pathology Museum, known after 1914 as the Coplin-McFadden Museum.

In 1960, Jefferson, like many schools, disbanded its museum. Fortunately, the models were sent to the Mütter Museum (see Fig. 5). Minutes of a 19 September 1960 museum committee meeting state: "that a great many cartons of wax models had been received from Jefferson Medical College." Ella N. Wade, the curator, sorted the models by diseases, determined that 24 models were suitable for the Mütter Museum, and arranged for the remainder to be given to the Armed Forces Medical Museum (now the National Museum of Health and Medicine). These models, which were shipped in three cartons weighing 25 pounds in toto, are not currently identified as part of the National Museum's collection. Records at Jefferson indicate that they had also purchased European wax models for their museum. The question remains unanswered as to whether or not the models received in 1960 were the latter, or the ones originally in the Mütter collection.

The Mütter Museum's next major acquisition of dermatological wax models came in 1986. These models from the University of Pennsylvania originated in the Duhring Collection of dermatological models and the Wood and Smith Pathology Collections, which contained some moulages of skin diseases.

---

41. Baretta, *Catalogue des Moulages.*

Figure 5. Pustular crustations with destructive tendency due to early tertiary syphilis, by unknown artist. Presented to the Mütter Museum by the Jefferson Medical College, 1960.
Photo by L. Cathryne Foedisch.

The Mütter Museum's current holdings of both anatomical and pathological wax models number 276, of which 118 are dermatological. Several collections of general medical interest had been purchased by the museum from European sources in the late nineteenth century. These include anatomical models from Vasseur and the Maison Tramond and dermatological models from Baretta, all from Paris. Other modelers whose works are in the collection include Von Johnsen of Freiburg, Heinrich Kasten of Berlin, Fritz

Kolbow of Dresden, Alfons Kröner of Breslau (Wroçlaw), Joseph Towne of London, and James Frank Wallis of Washington, D.C.

The models suggested by Jay Frank Schamberg and created by James Frank Wallis will be discussed under the National Museum of Health and Medicine in Washington, D.C. Their work seems to have been started at the Philadelphia Polyclinic, which became a part of the Graduate School of Medicine of the University of Pennsylvania in 1916, and possibly the Southern Dispensary.

St. Louis, Missouri. Charles Pope is known to have purchased moulages depicting the ravages of syphilis for the St. Louis Medical College in the mid-nineteenth century. More details are lacking.[42]

Washington, D.C. The Army Medical Museum has possessed a collection of wax models since its inception. How many of them arrived at this museum is unclear, but many Baretta models had been purchased in the nineteenth century. A full-time model department at the museum was begun in 1919. James Frank Wallis, a Philadelphia dermatologist who had been fascinated by wax models, was the first head. Many models were made by Wallis in conjunction with Eleanor Courtenay Allen. They included depictions of such diseases as gangrene, burns, contact dermatitis, and syphilis. About 1921, Wallis formed the Laboratory of Medical Art in Washington for the purpose of selling wax models.[43]

The museum, whose name was recently changed from the Armed Forces Medical Museum to the National Museum of Health and Medicine, is located on the campus of the Walter Reed Medical Center in Washington, D.C. Many of the 430 wax models in the collection illustrate dermatological conditions. Currently, there are 101 Baretta models, 71 Gottheil models, 20 Wallis and Allen models, and some by Bainbridge, Blair, Jules Talrich, and Vasseur (see Fig. 6).[44]

Ten wax models from the Duhring collection were purchased by the Smithsonian Institution's Division of Medical Sciences from the auctioneer who had obtained these models from the University

---

42. Duhring, *Rise of American Dermatology.*

43. James Frank Wallis, "Announcement," *Archives of Dermatology and Syphilology,* 1921, *3*:164.

44. Lawrence Charles Parish and Adrianne Noe, "Wax Models of the Skin," *International Journal of Dermatology,* 1989, *28*:230, 242, 258, 304, 344, 369, 398, 433, 450, 507, 541, 590, 602; Wallis, "Announcement"; Shufeldt, "Wax Modeling Department of the Army Medical Museum"; Adrianne Noe, personal communication to author, 1989.

Figure 6. Wax model created by James Frank Wallis for the Army Medical Museum in 1918, now accessioned by the National Museum of Health and Medicine, Washington, D.C.
Courtesy of Alan Hawk.

of Pennsylvania and added to the National Museum's collection. No other dermatological moulages are in the collection.

Toronto, Canada. The Museum of the History of Medicine at the Academy of Medicine in Toronto has 49 moulages, some of which depict syphilis and other cutaneous maladies. W. P. Douglas made a model of primary syphilis and another of "craniotabes" in 1920 for the Canadian Social Hygiene Council. Several moulages of syphilis and gonorrhea were done by Louis Niclet at the Hôpital Saint-Louis about 1900. Between 1931 and 1935, Maria Wishart and Dorothy Foster of the Art Service of the department of medicine of the University of Toronto Faculty of Medicine created 13 moulages of skin diseases.[45]

Collections in South America

Guarulhus, Brazil. The collection in the city of Guarulhus, part of Greater Saõ Paulo, was made by Augusto Esteves (1891–1966) for

45. Felicity M. Nowell-Smith, personal communication to authors, 1989.

Figure 7. Pemphigus vegetans, modeled by Augusto Esteves. Accessioned by the Greater Saõ Paulo School of Medicine, Saõ Paulo, Brazil.

the Penifigo Hospital of Saõ Paulo. When this hospital was closed, the models were placed in the Greater Saõ Paulo School of Medicine (see Fig. 7). The models were exhibited at the VI World Congress of the International Society of Dermatology: Tropical, Geographic, and Ecologic, in Rio de Janeiro, on 30 April 1989.[46]

Rio de Janeiro, Brazil. Several collections once existed in the city's medical schools, and models were even made locally. An Italian immigrant named Baldissari and his son made dermatological

46. Antar Padilha-Goncalves, personal communication to authors, 1989.

models for several years. These were used for teaching at the major teaching hospital, when Arminio Fraga and later his son Sylvio were chiefs of service. The Baldissaris also made models for the General Polyclinic of Rio de Janeiro and the Saõ Miguel Pavilion of the Santa Casa hospital of Rio de Janeiro. Unfortunately, these collections were destroyed by vandals.[47]

Saõ Paulo, Brazil. The University of Saõ Paulo boasts of a history of medicine collection at the Augusto Esteves Museum. This was begun in 1980 and contains 259 models, some by Esteves. In addition to moulages on various dermatological entities, there are ones on leprosy, leishmaniasis, and other tropical diseases. These were collected by Carlos da Silva Lacaz, emeritus professor of mycology.[48]

Caracas, Venezuela. A collection of dermatological models, probably from Paris, is said to have been extant until the 1960s at the Central University of Venezuela.[49]

Collections in Europe

Vienna, Austria. Ferdinand von Hebra, the first professor of dermatology at the Vienna Medical School, was most interested in graphic illustration of skin disease. In addition to commissioning the colored illustrations created by Anton Elfinger and Carl Heitzman (1836–1896), Hebra was instrumental in developing the moulage collection at the Allgemeine Krankenhaus.

Moriz Kaposi (Kohn), who succeeded Hebra as director of the hospital, obtained the services of Karl Henning (1860–1917) as a modeler. Even today, 1,570 of his models still exist in Vienna. Because Baretta's techniques were kept secret, Henning developed his own methods in the preparation of moulages. Moulage making was carried on by his son Theodor (1897–1946) until 1939.[50]

In addition to the many models still extant in the dermatology clinic at the Allgemeine Krankenhaus, some moulages relating to

---

47. Ibid.

48. Carlos da Silva Lacaz, *Museo Ceroplástico Augusto Esteves* (Saõ Paulo, Brazil: Private Printing, 1981), pp. 1–5.

49. Francisco Scannone, personal communication to authors, 1989.

50. Karl Portele, "Die Moulagensammlung des Pathologisch-Anatomischen Bundesmuseums," *Mitteilungen des Pathologish-Anatomischen Bundesmuseums in Wien,* 1977 (new series), *1*:1–84; Sundhaussen et al., *Moulages.*

skin disease can be found in the Josephinum Museum.[51] Of the over four thousand models once in Vienna, 2,358 still remain.[52]

Brussels, Belgium. Bayet organized a collection of dermatological models early in the twentieth century in the Skin Clinic of the University of Brussels. Unfortunately, no details are known of their whereabouts or of the existence of any other moulages in Belgium.[53]

Sofia, Bulgaria. Wax models were introduced to the Institute of Dermatology in Sofia in 1922, under the direction of Bogŏmil Beron. Stefchev and Borodaevsky began to make medical moulages. Other modelers included Antonov, Alissov, and Prodewski. A total of 333 models are extant, with the last being made in 1942. These include 79 representing infectious diseases, 48 sexually transmitted diseases, and the remainder other dermatological entities. The latter include patients with sodoku, myiasis linearis, and xeroderma pigmentosum.[54]

Prague, Czechoslovakia. Although there are two departments of dermatology in Prague, only the II Department has a collection of moulages. The collection was begun in 1920 and transferred to this department in 1945. The two hundred models, displayed under glass covers, were purchased from Vienna, Dresden, and Moscow or made in Prague by V. Frîc.[55]

Copenhagen, Denmark. Wax models were used at the Finsen Institute in Copenhagen. A large collection of moulages was kept not only to illustrate various tumors that might be responsive to the Finsen lamp, a concentrated carbon arc light, but also to provide before and after examples for the treatment. Over the years, the models fell into disrepair. The institute was merged with the university hospital in 1988. Most models were placed in storage, but some may be used in a special permanent exhibition in honor of Niels Finsen at the Medical History Museum.[56]

---

51. Konrad Allmer and Marlene Jantsch, *Katalog der Jospehinischen Sammlung, Anatomischer und Geburtshilflicher Wachspräparate* (Graz-Köln, Austria: Hermann Bölau Nachf, 1965).

52. Thomas Schnalke, Hans-Günther Beck, and Walter Lechner, "Die Moulagen der Universitäts Hautklinik Würzburg als Beispiel einer Deutschen Sammlung-Geschichtliche Entwicklung und Didaktischer Wert, *Hautarzt,* 1987, *38*:426–429.

53. M. Willemsen, personal communication to authors, 1989.

54. Kyrill Pramatarob, personal communication to authors, 1989; N. Botev, personal communication to authors, 1989.

55. Albrecht Scholz to Lawrence Charles Parish, correspondence, 1989.

56. Niels Hjorth, personal communication to authors, 1989.

Paris, France. The museum at the Hôpital Saint-Louis had its origins in 1866, when Alphonse Devergié, head of both an internal medicine and a dermatology unit, gathered together the colored illustrations of disease conditions available in the hospital. Charles Lailler continued to develop the collections and had a few models made by an unknown modeler who then abruptly left for America. Lailler then found Jules Baretta, who had been making fruit displays from papier maché. Baretta was an immediate success. So prolific was this artist that he had created 1,800 models before the end of the nineteenth century.

The Baretta models were located in the Bazin Pavilion until 1884, when a building was completed for the museum. The models were then displayed by diseases but in alphabetical order. Some were also made by Jules Talrich (late nineteenth century) and by the Maison Tramond.[57]

Following Baretta's death in 1923, Louis Niclet (1867–1924) was made the official modeler at the Hôpital Saint-Louis. He soon died of a hospital acquired infection, but in his career he had made 480 moulages, demonstrating the same exacting attention to detail that had made Baretta famous. Niclet's successor was Couvreur who made only 10 moulages before his death in 1926. The last modeler was Stephane Littré who was appointed in 1928. His final model depicted a patient with malignant atrophic papulosis of Degos (Degos's disease).

Besides the models of its official moulagers, by 1876 the museum also included 310 models of congenital syphilis made by Charles Jumelin for Parrot and 435 from the Hôpital de Lourcine (now called the Hôpital de Broca) made for Alfred Fournier. These models were distinguished from Baretta's by labelling the former with a "J" and the latter with a "B." An additional 510 surgical models were accessioned; these were made by Baretta for Péan. In 1922, the collection totalled four thousand wax models, most of which remain on display.[58] Today, there are probably 4,500 moulages in the collection.

Catalogues were produced by the museum to describe the moulage collection. The first edition was edited by Henri Feulard in

---

57. Adrianne Noe, personal communication to authors, 1989.

58. Douglass W. Montgomery, "The Saint Louis Museum for Diseases of the Skin," *Journal of Cutaneous Disease,* 1911, 29:428–432; B. Barker Beeson, "The Hôpital Saint-Louis," *Archives of Dermatology and Syphilology,* 1935, *32*:563–568; Solente, "Musée de l'Hôpital Saint-Louis."

1889. Louis Wickham was in charge of the second edition which appeared in 1900. A third revision was undertaken by Léon Brodier in 1922.

Visiting dermatologists for over a century have been fascinated by the huge collection. The detail, coloring, and exactness of the moulages of Baretta and his successors have created an unmatched realism. The models are shown even today in the large glass display cases that sometimes are themselves overwhelming with their 30 or more moulages.

The nomenclature and classification system of the Hôpital Saint-Louis seems to have bothered several visiting professors of dermatology. Duhring made many changes in his copy of the catalogue.[59] Typical of the comments are those made by William T. Corlett, the well-known Cleveland dermatologist who noted:

> Lailler in 1871 observed a scaly eruption which he recorded pityriasis rubra, and of which Baretta made a model for the museum of the Hôpital St. Louis. A duplicate placed in the Royal College of Surgeons of England was labelled by Sir Erasmus Wilson, in 1873, "lichen planus retiformis." This model has since been identified by Radcliffe Crocker as belonging to the group of dermatoses which forms the title of this paper, (parapsoriasis).[60]

The great collections in Germany developed following the First International Congress of Dermatology in Paris. The dermatologists from Germany, in particular, were visibly impressed by the moulages in the museum at the Hôpital Saint-Louis. Over the next generation, they set about to build the most extensive dermatological moulage collections in the world.

Montpellier, France. Pierre Spitzner, who awarded himself the title of doctor, assembled a wax museum in the mid-nineteenth century. This began with his purchase of 80 anatomical wax models from the collection of Dupuytren, which he first exhibited in 1856 at the Pavillon de la Ruche, on what is now Place de la République in Paris. When this building was destroyed by fire he decided to travel, and exhibited his museum throughout Europe.

The Spitzner family and their successors maintained the collection until its final tour in 1984. The following year it was put up

---

59. Baretta, *Catalogue des Moulages.*

60. William T. Corlett and O. T. Schultz, "Parapsoriasis: A Resistant Maculo-Papular Scaly Erythrodermia, with a Report of Three Cases, Together with Pathological History," *Journal of Cutaneous Diseases Including Syphilis,* 1909, 27:49–71.

for auction and purchased for eventual deposit in the History of Medicine Museum at the Université René Descartes in Paris by the Roussel Pharmaceutical Company.[61] Since then it has been transferred to the Université de Montpellier.

At the time of the auction, the collection consisted of a large number of moulages and specimen of ethnological, anatomical, and pathological states. Among them were 116 dermatological models, of which 47 depict syphilis. The artists include Baretta (9), Jules Talrich (9), F. Thibert (1), and Vasseur (2).

Berlin, Germany. The extensive dermatological wax model collections in Berlin did not begin until 1889, following the First International Congress of Dermatology which had been held in Paris that year. Oskar Lassar, professor at the Charité Hospital from 1902 to 1907, and Edmund Lesser, senior physician there from 1896 to 1918, had become fascinated with moulages and wanted to have them in the capital city of imperial Germany. The two men's collections developed independently.[62] Slowness in the availability of wax models in Berlin led at least one physician in 1896 to make a plea for more attention to their acquisition and funds to do so. He contrasted the situation in Berlin with that in Paris, where four thousand francs were allotted each year at the Hôpital Saint-Louis for development of the collections, and in Vienna, where the Allgemeine Krankenhaus budgeted for accessioning up to one hundred models annually with dermatology receiving one-fifth of these.[63]

To make moulages Lassar found Heinrich Kasten (1842–1921), a talented sculptor. Kasten produced excellent dermatological models, first at Lassar's private clinic on the Karlstrasse, beginning in 1889, and later at the Berlin Hautklinik. Following Lassar's death, Kasten followed his models to Hamburg, Lassar's hometown, and the St. Georg Hospital, to which the collection had been given.[64] Edmund Lesser chose Fritz Kolbow to produce the models for the museum at the Charité Hospital, beginning in 1900. Lesser was the director of the Skin Clinic from 1896 to 1918, so that he was in a position to exert influence on the development of

61. Bruno Pons, personal communication to authors, 1989.

62. K. Winkler, "Dermatology in Berlin — A Review," in Joachim J. Herzberg and Günter W. Korting, eds., *On the History of German Dermatology* (Berlin, Germany: Grosse, 1987), pp. 133–158.

63. J. Schwalbe, "Zur Geschichte der 'plastichen Anatomie,' " *Deutsche Medizinische Wochenschrift,* 1896, *22*:761–762.

64. Albrecht Scholz, "The History of Dermatological Moulages," in Herzberg and Korting, eds., *History of German Dermatology,* pp. 187–191.

the collection.[65] It is not known how many models existed before World War II, but many survived until the 1960s, when Wolfang Gertler, the director of dermatology at the time, selected eight models from the collection and gave the remainder to a candlemaker for wax.[66]

Kolbow was extremely busy, dividing his time between Berlin and Dresden. He also produced models for the Berlin Pathological Institute, now the Virchow Institute. Rudolf Virchow himself commented that Kolbow's work had won, "in high degree my complete satisfaction."[67] Between 1910 and 1918, he made models in Dresden for the Pathoplastic Institute and was its moulage director. Following the Armistice after World War I, he returned to Berlin to conduct a commercial venture for making teaching models.[68]

Alfons Kröner (n.d.–1937) learned modeling from Paul Berliner. He worked in Berlin for a short time, before going to Breslau (Wroçlaw) to make models for Albert Neisser.[69]

Bonn, Germany. Erich Hoffman, when he became head of the department of dermatology at the University of Bonn in 1910, started what would become a large collection. It at one time included at least 894 models. Now about six hundred models arranged according to disease diagnoses remain.[70] Some of the models were made by Auguste Kaltschmidt from Rostock and by Otto Vogelbacher from Freiburg. There are also Baretta models, some even in their original frames.[71] A catalogue of the collection was prepared for the exhibition held for the XV Congress of the German Dermatological Society in Bonn, 5–7 September 1927.[72]

Breslau, Germany. (See Wroçlaw, Poland.)

Cologne, Germany. The department of dermatology in this city once had approximately two hundred models. The collection was founded by Ferdinand Zinnser in the early years of the twentieth

---

65. Günter Stüttgen, "Edmund Lesser and the International Congress of Dermatology," *International Journal of Dermatology,* 1988, 27:269–273.

66. Scholz, "History of Dermatological Moulages."

67. Ibid.

68. Preisverzeichnis der Moulagen, Pathoplastiches Institut, 1908. Deposited in the Library of the College of Physicians of Philadelphia.

69. Paul Berliner, "Die Entwicklung der Moulagentechnik," *Deutsche Med. Pres.,* 1902, 6:87–90; Sundhaussen et al., *Moulages.*

70. R. Pfister, "Arbeitstagung für Dermatologische Bildkunst in Freiburg,/BR. vom 27.7-29.7 1956," *Dermatologische Wochenschrift,* 1958, *137*:401–463.

71. Sundhaussen et al., *Moulages.*

72. H. Schmitz and J. Wieler, *Moulagen-Verzeichnis der Bonner Universitäts-Hautklinik* (Bonn, Germany: H. Trapp, 1927).

century, with many models being made by the Catholic nuns of the Order of Katherine. A number of the models illustrated diseases of the mouth. A few models seem to have survived World War II, only to be lost when the Medical Faculty moved to a new building.[73]

Dresden, Germany. Eugen Emmanuel Galewsky developed the first dermatological wax model collection in Dresden shortly after beginning practice in 1891. He had learned the importance of wax models while studying under Albert Neisser in Breslau (Wroçlaw) and later visiting the magnificent collections in Paris and Vienna. His collection formed a major part of the 1911 Dresden Hygiene Exhibition.

The moulages, which were housed in the old part of Dresden in his clinic and apartment at 21 Christianstrasse were destroyed in the 1945 fire-bombing. Because the collection is no longer extant, the exact contents are unknown; however, it is thought that a majority of the models were made by Alfons Kröner and Fritz Kolbow, who had also made many of the models in Neisser's museum.[74]

Johannes Werther, a pupil of Edmund Lesser,[75] also began a collection in Dresden. This was housed in the Dresden-Friedrichstadt town hospital from 1903. Because of poor conservation, only one hundred moulages remain.

Between 1903 and 1928, 282 dermatological moulages were amassed at the city hospital. The modelers included Fritz Kolbow, Paul Geissler, who was there from 1904 to 1914, and Röseberg 1904 to 1904. The curator from 1915 to 1930 was Mrs. Ziegfeld,[76] at which time the collection numbered three hundred and sixty-eight moulages. Only 60 remain. The large majority of these moulages were displayed and listed in a catalogue for the 14th Congress of the German Dermatological Society, which was held in Dresden in 1925.

The German Hygiene Museum, which contained 2,700 moulages by 1945, many of which were dermatological, was yet another casualty of the bombing of Dresden. The museum had been founded by a famous industrialist to educate the public about matters of

---

73. Gerd Steigleder, personal communication to authors, 1989; Scholz, "History of German Moulages."

74. Albrecht Scholz, "Eugen Galewsky (1864 bis 1935)," *Dermatologische Monatsschrift,* 1972, *158*:53–68.

75. Stüttgen, "Edmund Lesser."

76. Scholz, "History of Dermatological Moulages."

health. Of this huge collection, only 12 dermatological moulages were salvaged. These few were restored during the 1950s.

Fritz Kolbow, who worked in Dresden between 1910 and 1918 before returning to Berlin to establish his Studio for Medical Teaching Aids, ranks as the most prolific of the moulagers of Dresden.[77] Galewsky and his partner Karl Linser were the medical advisors.

Following World War II, moulage making resumed under the direction of Ella Lippmann, She hired upwards of 12 modelers in an effort to restore the hygiene museum. From 1959 until 1980, Elfriede Hecker (1919–) was the chief modeler. Since 1980, Günter Simiatkowski has been in charge; seven other modelers are employed. Dermatological consultants have included Heinz-Egon Kleine-Natrop and, since 1980, Albrecht Scholz and Günter Sebastian. The museum has a catalogue listing about 550 moulages for sale, of which half are dermatological.[78]

Düsseldorf, Germany. A collection existed in the department of dermatology of the University of Düsseldorf but it was disbanded prior to World War II.[79]

Erlangen, Germany. The wax model collection founded by Leo Hauck is displayed in sliding wooden cabinets located on one side of a corridor of the dermatology clinic. Most of the 140 models were made by H. E. Becher with some being produced by Kürschner-Ziegfeld from Dresden and Theodor Henning of Vienna.[80]

Frankfurt am Main, Germany. Moulages were introduced by Karl Herxheimer, who became the director of dermatology in 1894 at Sachsenhausen Hospital. This institution was incorporated into the University of Frankfurt at its founding in 1914. Herxheimer was determined to develop a moulage collection and by 1904 he had employed a moulager named Winkler, whose signature can be found on approximately one-fourth of the present collection's models.[81]

Three hundred models remain today. The best examples were made by Baretta, Von Johnsen from Freiburg, and Alfons Kröner from Breslau (Wroçlaw).

---

77. Kleine-Natrop et al., "Moulagen aus Dresden."
78. Scholz, "History of Dermatological Moulages."
79. Gerd Plewig, personal communication to authors, 1989.
80. Sundhaussen et al., *Moulages.*
81. P. Altmeyer, J. Menzel and H. Holzmann, *Die Moulagen-Sammlung der Frankfurter Hautklinik* (Frankfurt, Germany: Zentrum für Dermatologie und Venerologie der Universtitätsklinik, 1987).

Freiburg, Germany. Eduard Jacobi, a pupil of Albert Neisser, established the moulage collection. At first, Jacobi hired Von Johnsen to make models, but he stayed only a short time. Otto Vogelbacher took over the position and made the largest number of moulages in the dermatology department. Some of these models can be seen in the atlas published by Jacobi in 1904.[82]

By 1939, they numbered over two thousand, due to the encouragement of Jacobi's successors, Georg Alexander Rost and Alfred Stühmer. Stühmer found a new moulager, Theodor Niehues, when Vogelbacher died.[83] Today, there are eight hundred moulages displayed in cabinets placed in the attic of the hospital.[84]

Göttingen, Germany. There are 60 moulages in the dermatology clinic.[85]

Halle, Germany. The dermatological moulages have disappeared from this city.[86]

Hamburg, Germany. Dermatological wax models arrived in Hamburg in 1907, when Oskar Lassar's collection was presented to the St. Georg Hospital. The collection was comprised of models made by Heinrich Kasten in Berlin. As noted Kasten made it possible for Eduard Arning, the director of dermatology, to accompany his models to their new home.[87]

The clinic at the University of Hamburg-Eppendorf contains about four hundred models on display with many more in storage. The collection may at one time have included as many as one thousand models.[88] Many come from the Oskar Lassar collection made by Kasten. Others were made by Ary van Bergen and Paul van der Forst (see Fig. 8). A catalogue was prepared by H. Mensing in which the models are arranged in diagnostic groups.[89]

Hannover, Germany. The moulage collection in the city's department of dermatology was established in 1928 by Gustave Stümpke, director of the Linden Dermatological Clinic. He brought

---

82. Eduard Jacobi, *Atlas der Hautkrankheiten* (Berlin, Germany: Urban & Schwarzenberg, 1909).

83. Ibid.; Scholz, "Eugen Galewsky."

84. Sundhaussen et al., *Moulages*; Alfred Stuehmer, "Zuvil Morphologie? Photographie und Wachschildnerei in Unterricht und Forschung unsere Faches," *Hautarzt,* 1952, *4*:246–250.

85. Sundhaussen et al., *Moulages.*

86. Scholz, "History of Dermatological Moulages."

87. Ibid.

88. Thomas Schnalke, "Die Hannoverschen Kunstoffmoulagen," *Hautarzt,* 1987, *38*:740–742.

89. Sundhaussen et al., *Moulages.*

Figure 8. Wax model created by Ary van Bergen and displayed at the University of Hamburg-Eppendorf, Hamburg, Germany.

to Hannover Friedel Hartje (1904–1971) who made many outstanding models. Although the collection survived World War II, a flood in 1947 destroyed a vast majority of the moulages.

In that same year Jo Hartung became director and began to rebuild the collection, In 1950, Eduard Fuge (1916–), a painter, was engaged as the modeler and eventually created approximately four hundred moulages, made, it is worth noting, from

polyvinyls. In 1984, the collection was moved to the basement of a new clinic building. Three hundred models made by Fuge are extant. Two hundred and fifty-two were known to have been placed here and elsewhere 30 years ago.[90]

Jena, Germany. A moulage collection once existed at the major dermatology clinic. It was destroyed in 1958.[91]

Kiel, Germany. Enno Christophers, chairman of the department of dermatology at the University of Kiel, is in the process of restoring the wax model collection. The collection was founded by Victor Klingmülerr and was supplemented by models taken from Breslau (Wroçlaw) in the closing days of World War II. The moulages number over one thousand and were made by Kröner, Kolbow, H. E. Becher from Munich, E. Saalborn from Kiel, D. Klein from Kiel, O. Harloff, and W. Beck.[92]

Leipzig, Germany. A dermatological moulage collection was founded by Johann H. Rille. This survived World War II, only to be decimated in the 1960s.[93]

Marburg, Germany. There were known to have been at least 50 dermatological wax models in 1958.[94]

Munich, Germany. Since 1904, there has been an outstanding collection of dermatological wax models in Munich. Karl Posselt (1837–1916) was the first moulage maker but the most prolific modeler was Eduard Hammer who was a member of the fourth generation in his family to work with wax. Hammer had initially conducted an anatomical museum next to his studio from 1893 until 1902 which contained over six hundred anatomical models. By 1926, he had amassed 1,374 models which were exhibited during that year. A part of the collection was put on tour. Unfortunately, it was destroyed by fire in 1931 in Dortmund. Subsequently, the collection was partially rebuilt.

Other models in the Munich collection were prepared by the Zeiller family. Paul Zeiller acquired Castle Grünwald near Munich in 1879, and established an anatomical wax moulage museum there. His son and grandson continued the family tradition of wax sculp-

---

90. Pfister, "Arbeitstagung für Dermatologische Bildkunst"; Schnalke, "Hannoverischen Kunstoffmoulagen."

91. Scholz, "History of Dermatological Moulages."

92. Heinz-Egon Kleine-Natrop and Albrecht Scholz, *Totenmasken, Wachsbilder und Moulagen* (Dresden, Germany: Gester & Haute, 1984), pp. 1–16.

93. Albrecht Scholz, to Lawrence Charles Parish, correspondence, 1989.

94. Pfister, "Arbeitstagung für Dermatologische Bildkunst."

turing. Yet another modeler, H. E. Becher, produced models for Munich while also selling them to the clinics in Erlangen and Tübingen.[95]

In the late 1970s, the wax models which had been stored at the Ludwig-Maxmillian University Dermatology Clinic were resurrected under the direction of Otto Braun-Falco, professor and chairman of dermatology, and Gerd Plewig, continuing a restoration of the collection which had been undertaken in the late 1950s by Elsbeth Stoiber of Zürich. Currently, about 40 excellent dermatological models are on display in the library of the Hautklinik.[96]

Münster, Germany. Sixty-four moulages are on display in an anteroom to the library. Some of the older moulages were made by Alfons Kröner and Otto Vogelbacher, with newer ones by Stoiber. An additional 30 are stored in the cellar.[97]

Rostock, Germany. This city once had an enviable collection of dermatological wax models. It had been initiated by Max Wolters in 1908–1909 at the Rostock Skin Hospital. The next professor, Karl Friboes, employed Auguste Kaltschmitt who made most of the three thousand moulages in the collection. Most of the wax models were, however, destroyed in an air raid in 1944. Beginning in 1989, about 50 models have been restored in the German Hygiene Museum in Dresden.[98]

Steittin, Germany. (See Szczecin, Poland.)

Tübingen, Germany. There are 212 models in the moulage closet situated behind the lecture hall. They hang on wire grating. Among the works exhibited, the older ones were done by H. E. Becher, Otto Vogelbacher, Fritz Kolbow, Alfons Kröner, and Schiler. More recent models were done by Elsbeth Stoiber. Of particular interest is the group of moulages by the Sisters of Lindenburg of Cologne who are known for using linen sheathing.[99]

Würzburg, Germany. The 282 extant models have been relegated to the basement where they are shown in their original cabinets. The vast majority are by Kröner. Other models are by Markus Sommer of Sonneberg, Fritz Kolbow, and Otto Vogelbacher. Seven special relief moulages made from artificially synthesized materials

---

95. Sundhaussen et al., *Moulages.*

96. Heinrich Röhrich and Gerd Plewig, "Pathologisch-Anatomische Lehrmodelle in Moulagen," *Hautarzt,* 1979, *30*:259–263.

97. Sundhaussen et al., *Moulages.*

98. Scholz, "History of Dermatological Moulages."

99. Sundhaussen et al., *Moulages.*

from the Dresden Hygiene Museum were assembled by K. Zieler in 1909.[100]

Athens, Greece. The Andreas Sygros Museum opened in 1912 with a significant collection of wax models prepared by G. Thomas Photinos, the then and first professor of dermatology at the University of Athens. Photinos had studied a few years before in Paris but had initially learned modeling himself. Baretta had refused to train him or other dermatologists. During the continuation of Photinos's studies in Berlin, Oskar Lassar prevailed upon their moulage maker Heinrich Kasten to teach Photinos the techniques.[101] Subsequently, Photinos became well known for his models, exhibiting at the VII International Congress of Dermatology in Rome in 1912. He also prepared 60 moulages of cutaneous ailments incurred during the Bizani-Ioanninan siege of 1913. These were given to the Military School of Paris at Val de Grâce.

Photinos worked with the painter K. Mitropoulos and trained other technicians to make dermatological models.[102] The Sygros Museum currently holds 1,660 moulages. Although no longer used for didactic purposes, the museum is carefully maintained.

Budapest, Hungary. Beginning in 1911, Ludovicz Nékám amassed a distinguished collection of moulages in the department of dermatology at the university. Some models were saved from the ravages of World War II, only to be destroyed in the 1956 uprising.[103]

The Semmelweis Medical Historical Museum in Budapest contains several dermatological wax models dating from the nineteenth century.[104]

Debrecen, Hungary. There are 264 moulages in the dermatology clinic at the University of Debrecen (see Fig. 9). The collection began in 1923, when the chairman of dermatology, Edward Neuber, organized a permanent exhibit. His successor, Arpárd Skutta, had artistic skills and during his tenure from 1935 to 1948, he made many himself. Another modeler at Debrecen was J. Vincze.[105]

---

100. Ibid.; Schnalke et al., "Moulagen der Universitäts-Hautklinik Würzburg."
101. Stratigos, *Selected Pieces.*
102. Photinos, "Herstellung und Bedeutung."
103. István Rácz, personal communication to authors, 1989.
104. József Antall, *Pictures from the Past of the Healing Arts* (Budapest, Hungary: Semmelweis Medical Historical Museum Library and Archives, 1972).
105. István Rácz, personal communication to authors, 1989; Kleine-Natrop and Scholz, *Totenmasken.*

Figure 9. Display of wax models in the dermatology clinic, University of Debrecen, Debrecen, Hungary.
Courtesy of István Rácz, M.D., Budapest, Hungary.

Pécs, Hungary. In 1925, Soma Beck, chairman of the department of dermatology, began the wax model collection. This was continued by Károly Berde and later Nicholas Melcze, under whose direction the last two models to be made in Hungary were finished in 1947.[106]

Szeged, Hungary. A collection of wax models of skin disease is no longer extant.[107]

Bologna, Italy. The earliest wax models in Italy were created in Bologna. These were the masterpieces of such workers as Ercole Elli (1700–1766), Giovanni Manzolini (1700–1755), and his wife, Anna Morandi (1716–1755), many of which are preserved in the Anatomy Institute of the University of Bologna. In the pathology department of the University of Bologna there are 160 preparations, of which 11 relate to the skin. The earliest of these dates back to 1827. Models currently extant depict diseases such as smallpox, nevi, and lipomas.[108]

Florence, Italy. The tradition of wax models is very strong in this Tuscan city. Some of the moulages, created by Felice Fontana (1730–1805), relate to cutaneous afflictions, although most of his work concerns anatomical depiction.[109]

Clemente Susini (1754–1814) was the chief and most famous modeler at La Specola. His successor, Luigi Calamai (1800–1859), made models from 1840 to 1850, depicting many skin diseases. He modelled the statue, the Leper, which actually shows a patient with severe crusted scabies. Other moulages show favus, lupus vulgaris, and psoriasis. These models may be seen at the department of pathological anatomy at La Specola.[110]

Milan, Italy. Wax models were initiated in Milan by Angelo Bellini and A. Bertarelli, assistant to the professor of dermatology. Bellini had first become intrigued by moulages at the Hygiene Exposition held in Rome in 1894 and later by the collections in Naples.

---

106. István Rácz, personal communication to authors, 1989.

107. Ibid.

108. D. De Ronchi, personal communication to authors, 1990.

109. Luigi Belloni, "Anatomia Plastica: The Wax Models in Florence," *Ciba Foundation Symposium,* 1960, *8*:129–132.

110. Martini, "Egisto Tortori"; L. Negri and G. Wever, "La 'Sabbia Norvegese' in una Cera del 1851 Appartenente all Raccolta dell'Istituto di Patologia di Firenze Studio sul Considdetto 'Lebbroso' di Luigi Calamai," *Archivo de Vecchi per l'Anatomia Patologica e la Medicine,* 1954, *20*:893–911; Giancarlo Zampi, *Le Cere del Museo dell'Istituto Fiorentino di Anatomia Patologica* (Florence, Italy: Arnaud Editorie, 1983); Emiliano Paconesi, personal communication to authors, 1989.

He went to Paris to study under Baretta, but like others, he had to develop his own techniques.[111] Bellini made over one hundred models, most of which are extant and some of which are displayed in the First Department of Dermatology of the University of Milan.[112]

Amsterdam, The Netherlands. The wax model collection was begun early in this city and is comprised almost exclusively of moulages made by Heinrich Kasten of Berlin. According to the numbering of the models, about 150 existed at one time. Currently, nine are exhibited in the department of dermatology at the local university, with approximately 70 remaining in storage. Subjects include psoriasis, elephantiasis, and sexually transmitted diseases.

Leiden, The Netherlands. A nice collection exists in the department of dermatology of the University of Leiden, having been developed in the early years of this century. An early modeler won a medal at the International Congress of Dermatology held in Budapest in 1935. Through the 1950s, there was a modeler, also a photographer, who was attached to the department.

Rotterdam, The Netherlands. Models on a variety of dermatological conditions are maintained in the department of dermatology and venereology at the University of Rotterdam. These were purchased in Dresden in the early years of this century.[113]

Utrecht, The Netherlands. A collection of dermatological models exists in the university skin department at Utrecht. Most of the moulages were made prior to World War II, although there was a modeler attached to the department until the 1950s. The collection continues to be used for teaching purposes. The modeler received a gold medal at the 1935 International Congress of Dermatology in Budapest.[114]

Kraków, Poland. A wax model museum was started in Kraków at the Jagelonian University in 1840 by Ludwik Bierkowski, professor of surgery, who also made several models himself. Because of the extent of untreated disease at this time, he was able to record

---

111. Angelo Bellini, "La Modellazione in Cera delle Malattie Cutanee," *Giornale Italiano di Dermatologia e Venereologia,* 1908, *43*:722–732; A. Zanca and R. Tagliavini, "Iconografia Dermatologica e Venerologica: Ieri e Oggi," *Acta Medica Historiae Patavina,* 1980–1981, 27:81–97.

112. Ruggero Caputo, Carlo Gelmetti, and Corinna Rigoni, *Le Cere Dermatologiche dell'Universitià di Milano* (Milan, Italy: Recordati, 1989).

113. R. Shift, personal communication to authors, 1987.

114. G. Vonkelaar, personal communication to authors, 1986; E. Young, personal communication to authors, 1986.

extensive pathological states. By 1860, there were over seven hundred moulages in the collection.

The museum was liquidated in 1874. The department of pathological anatomy at the university received 376 models, but some of these were later destroyed. Fourteen models were given to the veterinary department, and several were placed in the Kraków Museum of Medical History. How many were related to skin disease is not known.

In the 1950s a survey was taken of the extant models. Eighty-five models remained in the department of pathological anatomy. The department of the medical history museum had only three wax models; these were heads.[115]

Shortly after the founding of Poland's first skin clinic in Kraków in 1863, a specialized collection was formed under Anton Rosner. The number of models gradually increased in number. They were actively used in teaching until 1939. After World War II they were held in storage until 1986, when many were restored. Currently, there is a display of 90 moulages: 49 modelled by Henning from Vienna between 1896 an 1910, and five made by Kazimierz Lejman (1907–1985), who subsequently became chairman of dermatology in the city.[116]

Szczecin, Poland. Several wax models, particularly those illustrating sexually transmitted diseases, survived World War II and were seen at the general hospital. Most of these have now disappeared.[117]

Wroçlaw, Poland. The renowned moulage collection began in 1897, when Albert Neisser, the director of the Hautklinik from 1882 until 1916, set aside a room in the new clinic building.[118] Paul Berliner was the modeler from 1890 to 1897.

Next came Alfons Kröner who stayed for 40 years and became world famous. He created over three thousand models, many of which became the centerpieces of wax model collections throughout Germany and even in China.[119] Under the direction of Victor Klingmüller (later, to head the department in Kiel), he recorded in wax

---

115. Kazimierz Lejman and Z. Kukulski, "Ludwik Bierkowski Jako Prekursor Ikongrafii Wenerologicznej i Dermatologicicznej," *Przeglad Dermatologiczny,* 1961, *48*(suppl):563–572.

116. Ibid.

117. Macie Lambert, personal communication to authors, 1989.

118. Albrecht Scholz and Feliks Wasik, "Albert Neisser, 1855–1916," *International Journal of Dermatology,* 1985, *24*:373–377.

119. Scholz, "History of Dermatological Moulages."

such diseases as epidermolysis bullosa hereditaria and lupus vulgaris.

During the chairmanship of Josef Jadassohn, the clinic boasted 2,695 models. Eduard Jacobi photographed the models for his atlas, which made the moulages known to dermatologists throughout the world.[120] At the 1904 St. Louis World's Fair, Kröner's models won both the grand prize and the gold medal for moulages. Eventually, Kröner made his models available commercially and departments of dermatology in many centers were able to purchase these excellent teaching aids.[121]

Following World War II, Breslau became Wroçlaw. The new university has continued to treasure its wax moulages, and they are maintained by the current director of dermatology, Feliks Wasik. Presently, 282 models are displayed on wire screens in the same museum room behind the library in Albert Neisser's building. There are an additional 10 plaster of Paris figures depicting leprosy. These were made at Castan's Panopticon in Berlin.[122]

Cluj-Napoca, Romania. In 1919, the new professor at the Romanian University, Coriolan Tataru decided that the dermatology clinic needed better models than those it owned. He traveled throughout Europe to learn more about the art of modeling. He succeeded in attracting Richard Hoffman, a new assistant in the clinic in 1924, as model maker. For the next 16 years, Hoffman executed about two hundred models of syphilis, pellagra, psoriasis, and cutaneous tuberculosis. In 1935, several of these models were exhibited at the World Congress in Budapest, where they won a gold medal.[123]

Barcelona, Spain. The museum of the History of Medicine of Catalonia contains 15 models of subjects such as syphilis, cutaneous tuberculosis, and leprosy. The models, made between 1920 and 1930, were done by Noguer and Sevillano.[124]

---

120. Jacobi, *Atlas.*

121. *Katalog und Erklärung der Ausgestellten Wachsmodelle der Dermatologischen Klinik Breslau und des Alfons Kröner* (Breslau, Germany, n.d.); *Katalog der Wachsmodelle der Königl. Univers.-Klinik für Hautkrankheiten Breslau* (Breslau, 1905).

122. Sundhaussen et al., *Moulages*; Feliks Wasik, personal communication to author, 1989.

123. Albrecht Scholz to Lawrence Charles Parish, correspondence, 1989.

124. Felip Cid i Rafael, personal communication to authors, 1990.

Uppsala, Sweden. The department of dermatology at the University of Uppsala currently has eight models displayed in the lecture hall. These were made in Breslau (Wroçlaw).[125]

Zürich, Switzerland. Bruno Bloch, the first professor of dermatology at the University of Zürich, had become enamored of wax models during his student days in Vienna, Berlin, and Paris. In 1917, he began the wax model collection at the university. Five years later, he noted: "A dermatological clinic without its own moulage collection and without the opportunity . . . to have moulages made of practical or theoretically important cases is not complete."[126] Guido Miescher, Bloch's successor, possessed an equally strong liking for wax models and continued to place a great importance on the development of the Zürich collection.

The first modeler in the department of dermatology at the university was Luise Volger (1883–1956), who had made wax models in Berlin. The turmoil in Germany in 1918 induced her to move to Zürich at Bloch's invitation, and she remained there until her retirement in 1948. Four years later, Elsbeth Stoiber assumed the position of chief modeler and continued her work until her retirement in 1986, at which time she was the last modeler to be attached to a department of dermatology. By 1956, there were 1,200 dermatological moulages. Stoiber had added 170 models through 1979. Some of the models are exhibited in the department today, although in the 1960s a large number were placed in storage and three hundred were deaccessioned.[127]

Edinburgh, United Kingdom. Charles Cathcart (1853–1932) made many anatomical wax models and some of skin diseases. He was conservator of the Royal College of Surgeons of Edinburgh. The present location of the models is unknown.[128]

Liverpool, United Kingdom. A dermatology museum existed in Liverpool in the early years of this century. Stopford Taylor, the

---

125. Lennart Juhlin, personal communication to authors, 1990.

126. René Rüdlinger and Elsbeth Stoiber, "Auf den Spuren von Guido Mieschers Wissenschaftlichem Werk in der Moulagensammlung der Dermatologischen Universitätsklinik Zürich 1933–1958," *Hautarzt,* 1988, *39*:457–460; René Rüdlinger and Elsbeth Stoiber, "Die Ära Block im Spiegel der Moulagensammlung der Dermatologischen Universitätsklinik Zürich 1917–1933," *Hautarzt,* 1988, *39*:314–317.

127. Urs Boschung and Elsbeth Stoiber, *Waxbildnerei in der Medizin* (Zürich, Switzerland: University of Zürich Department of Dermatology, 1979), pp. 1–40; Rüdlinger and Stoiber, "Spuren von Guido Mieschers"; H. M. Koebling, personal communication to authors, 1979.

128. Pyke, *Biographical Dictionary.*

leader of dermatology in that city, had assembled photographs and wax moulages which were sufficient in number to occupy two rooms. According to Augustus Ravogli, the famous dermatologist from Cincinnati: "Many glass showcases contain elegant wax models made by MacKenna [Robert William MacKenna, also a Liverpool dermatologist.] The most important are those representing cases of pityriasis rubra pilaris, pityriasis rosea in all its varieties, erythema multiforme, lupus erythematosus, lupus vulgaris, tuberculosis, etc. The moulages are so well executed that they need no labels to be recognized." The whereabouts of the models are unknown, and no records have been found.[129]

London, United Kingdom. The Gordon Museum, a gift of Robert Gordon to Guy's Hospital, has a superb collection of wax models, mostly done by Joseph Towne. The exhibits are unique for they incorporate colored drawings and photographs to illustrate a particular disease process.[130]

The dermatological collection can be said to have been founded when Towne first began to work at Guy's in 1827. He made over one thousand models, of which 560 are now extant. Among the museum curators who influenced his works were Thomas Hodgkin, Samuel Wilks and Charles Hilton Fagge.[131] Fagge said of Towne:

> that it was a remarkable and most fortunate circumstance that, during the whole period of at least forty years, the models of skin diseases for our museum should have been made by a single artist, the same who supplied our splendid series of anatomical models. Of the pains which he has lavished upon his work, and the fidelity with which he has executed it, there is no need for me to speak; they are sufficiently apparent to all who have given the models the careful study which they deserve.[132]

The models depicted early descriptions of several diseases. According to an 1861 report the collection included linear atrophy,

---

129. Augustus Ravogli, "Far Echoes from the XVII International Congress of Medicine in London," *Journal of Cutaneous Diseases Including Syphilis,* 1914, 32:28.

130. *The Medical Museum of Guy's Hospital, 1825–1985* (London: United Medical and Dental Schools of Guy's and St. Thomas's Hospitals, 1985), pp. 1–16.

131. David J. Atherton and R. S. Wells, "A New Teaching 'Laboratory' for Dermatology at Guy's Hospital," *Clinical & Experimental Dermatology,* 1977, 2:121–125; Clive E. Handler, *Guy's Hospital, 250 Years* (London: Guy's Hospital Gazette, 1976).

132. Griffith, "Joseph Towne," p. 43.

glanders, the purpuric stage of smallpox, syphilitic keloid, and occupational dermatitis. By 1876, the collection was more extensive; 537 models, and a new catalogue was issued.[133]

In 1869, Erasmus Wilson announced in his own *Journal of Cutaneous Medicine and Diseases of the Skin* the formation of a wax model museum with the purchase of 27 duplicate models from the recently opened museum at the Hôpital Saint-Louis. These Baretta models included various "ekzemas," herpes zoster, and lupus erythematosus. Wilson frequently disagreed with the designations given in Paris and changed the titles of the models.[134]

Wilson continued to collect models for this museum in the Royal College of Surgeons. Sometimes they were copies from models at Guy's Hospital, other times, they came from Paris. In most instances, Wilson retitled them according to his own classification and nomenclature which were frequently at variance with those common at that time. As an example:

> As in other types of cutaneous disease, cases of anomalous or apparently hybrid scaly eruptions have been from time to time encountered. Lailler in 1871 observed a scaly eruption which he regarded as pityriasis rubra, and of which Baretta made a model for the museum of the Hôpital Saint-Louis. A duplicate placed in the Royal College of Surgeons of England was labeled by Sir Erasmus Wilson, in 1873, "lichen planus retiformis." This model has since been identified by Radcliffe Crocker as belonging to the group of dermatoses which forms the title of this paper.[135]

Over the years, additional models were added to the collection. The Royal College of Surgeons was, however, destroyed, along with the models, in the London Blitz in 1940.

The hospital at Leicester Square had a teaching collection of models that seemed to have been initiated in 1937. Alice Gretener came from Switzerland and was hired to make dermatological models. She worked in an attic room creating the models from plaster casts, many of which were once stored in the Homerton branch.

---

133. Samuel Wilks, "Description of Some New Wax Models," *Guy's Hospital Report,* 1861, 7:297–312; Charles Hilton Fagge, *Catalogue of the Models of Diseases of the Skin in the Museum of Guy's Hospital* (London: J. and A. Churchill, 1879).

134. William James Erasmus Wilson, "Dermatological Museum," *Journal of Cutaneous Medicine and Diseases of the Skin,* 1869–1870, *3*:83–93.

135. Corlett and Schultz, "Parapsoriasis."

The wax moulage was then painted with oil paints. The collection is quite large and will be displayed appropriately in the new building with the merger with St. Thomas's Hospital.[136]

There are 10 dermatological wax moulages at the Wellcome Museum for the History of Medicine from the Duhring Collection of Philadelphia. Other anatomical models are also in the collection.[137]

Moscow, U.S.S.R. Little is known about the origins of wax models in this country. A report from 1931 notes that there was a workshop for making moulages of venereal diseases in the State Venereological Institute in Moscow.[138] A generation later, wax models were still on display in the museum at the First Moscow Medical Institute. These are described as being of nineteenth-century vintage.[139]

The collection of the Second Moscow Medical Institute was founded in 1910 under the direction of A. I. Ljanzew. There are 372 moulages extant.

Saratov, U.S.S.R. In 1912, this collection was founded by P. S. Grigorijew. Ninety-one pieces are extant. Among the modelers were S. Fiweiski, A. Burdonska, F. J. Sokolov, and L. J. Bogman.[140]

Tashkent, U.S.S.R. An outstanding collection of moulages is currently used for teaching syphilology.[141]

Collections in Africa

Johannesburg, South Africa. Plaster cast models are made and kept in the department of anatomy at the University of Witwatersrand.[142]

---

136. Alice Gretener, "Moulage," *Medical and Biological Illustration,* 1960, *10*:145; Malcolm W. Greaves, personal communication to authors, 1989; P. D. Samman, *A History of St. John's Hospital for Diseases of the Skin, 1963–1988* (Oxford: Radcliffe Medical Press, 1990), pp. 44–45.

137. Russell, "Anatomical Manikins."

138. Howard Fox, "Dermatology in Soviet Russia," *Archives of Dermatology and Syphilology,* 1931, *24*:853–863.

139. Edward D. Fox, "A Visit to the Skin and Venereal Diseases Department, The First Moscow Medical Institute (Named After Sechenov)" *Clinical & Experimental Dermatology,* 1978, *3*:315–317.

140. K. Skriphin, personal communication to authors, 1983.

141. Heinz-Egon Kleine-Natrop, "Dermatologie und Plow in Mittelsaien," *Hautarzt,* 1970, *27*:136–139.

142. G. A. Macho, personal communication to authors, 1989.

Collections in Asia

Beijing, China. The collection at the Chinese Academy of Medical Sciences began in the 1930s with models brought from Europe. Some of these were made by Alfons Kröner of Breslau (Wroçlaw). The subjects range from syphilis to acrodermatitis chronic atrophicans to bromoderma (see Fig. 10).[143]

Shanghai, China. Wax models were introduced into the department of dermatology in the 1950s. The department employed a woman who made about 150 models. Approximately 120 are still on display.[144]

Fukuoka, Japan. Several universities developed wax model collections in the early twentieth century, due in part to the German influence on medical education. Seventeen institutions still have at least one model within their domain.[145]

The department of dermatology of Kyushu University, in Fukuoka, currently has about 50 wax moulages on display for teaching medical students. Models were introduced by Kenkichi Asahi, who served as the founding professor from 1906 to 1930. He had models made by Isaburo Niijima and Miki Ishimatsu. His successor, Seigo Minami, was so enamored of teaching models that he increased the collection to ten thousand. Most of these were made by Wataru Numasawa.

When Kentaro Higuchi became professor, he had only 15 more models made. The modeler was Hisashi Satonaga. The moulage room remained intact until 1976, when the department moved to a new building.[146]

Hirosaki, Japan. The collection of wax models in the department of dermatology at Hirosaki University was melted down for candle wax during World War II. Other details are not known.[147]

Kyoto, Japan. Kyoto University developed an outstanding collection of wax models beginning about 1925. At one time, there were about six hundred models in the department of dermatology. In recent years, the display room has been remodeled and 450

---

143. Hung-Chiung Li, personal communication to authors, 1987.
144. K. Kang, personal communication to authors, 1987.
145. Y. Nagatoya, "On the Use of Moulages in Japan," *Nihon Ishigaku Zasshi*, 1988, *34*:294–303.
146. H. Urabe, personal communication to authors, 1987.
147. K. Hanada, personal communication to authors, 1987.

Figure 10. Secondary syphilis modeled by Alfons Kröner and displayed in the department of dermatology, University of Beijing, China.
Courtesy of Hung-Chiung Li, M.D., Beijing, China.

moulages can be seen. Additional models have lately been made of less common diseases, such as tinea imbricata and favus.[148]

Nagasaki, Japan. A number of moulages are available for didactic purposes at the University of Nagasaki.

Tokyo, Japan. Keizo Dohi started the wax model collection at the University of Tokyo. He had been intrigued by the model collec-

148. S. Imamura, personal communication to authors, 1986.

tion in Vienna, when he was studying dermatology. Henning, the famous modeler there, taught him the technique.[149]

Early in the 1900s Dohi began to have moulages made in Tokyo. Eventually, the department had several modelers attached to it, and there were over two thousand models on display. Today, over four hundred flawless moulages are kept on display. The last of the Japanese modelers, Shuichi Nagayasu, has now retired.[150]

Collections in Australia

Melbourne, Australia. The only extant group of medical wax models is located in the University of Melbourne. Of the 13 relating to skin, a few are models made by Baretta and the remaining ones appear to have been made in Australia circa 1908. The subjects range from sporotrichosis to dermatitis artefacta.[151]

Conclusions

Even when dermatological moulages were at their height of fame, substitutes were being suggested for wax. For example, Noxon Toomey of St. Louis in 1928 proposed the use of dressed kid-skin, as it "is lighter, cheaper and quicker to make, and is not so subject to being broken by trauma or melted by heat as the wax moulage."[152] Eugen Galewsky in Dresden in 1926 had already reported the use of plastics as a more economical and durable replacement for wax.[153]

Wax models remain an accurate way in which to depict skin disease. Their realism can sometimes surpass color photography, but they do not have the capabilities of projection to large audiences. They can capture a realism or heighten the morphological aspects of a disease state, when the patient is not available or the condition

---

149. K. Kitamura, "Keizo Dohi: His Achievements in Dermatology and Syphilology, his Contributions to the Prevention of Venereal Diseases and the Development of Urology in Japan," *Japanese Journal of Dermatology (Series B),* 1966, *76*:348–354.

150. Y. Ishibashi, personal communication to authors, 1986.

151. Department of pathology, St. Vincent's Hospital, Melbourne, Australia, personal communication to authors, 1986.

152. Noxon Toomey, "Dressed Kid-Skin Moulages: A New Technique for the Colored Portrayal of Skin Lesions," *British Journal of Dermatology,* 1928, *40*:199–204.

153. Eugen Galewsky, "Demonstration von Nach Einem Neuen Verfahren Hergestellten Moulagen," *Archiv für Dermatologie und Syphilis,* 1926, *151*:219–220.

has changed. It is unrealistic to expect that practitioners might bring their own models to clinical meetings to illustrate unusual findings, as was once suggested by the American Dermatological Association:

> It is an established custom, in connection with the meetings of the American Dermatological Association to give an exhibition of photographs, drawings, models, or specimens relating to interesting cases. (1913)[154]

Some German dermatologists carried this tradition through 1930.[155]

Dermatological wax models can still be obtained in Dresden from the German Hygiene Museum. Moulages are made for votive offerings at a shop near Munich.[156] Exhibits of various forms of wax modeling also have appeared in recent years.[157]

Will every important academic department of dermatology have its own museum again? Probably not, despite periodic pleas in the literature for the rebirth of wax models for dermatological teaching.[158] But that does not diminish the important role in dermatological education that they once served and, indeed, continue to play in some cases. Several institutions have their own working collections which still serve as significant didactic aids. And regardless of their present usefulness, wax models belong to a unique and fascinating but, alas, almost lost form of art and representation. The message is that wax models should be preserved. In the words of James Frank Wallis:

> Although the camera is a useful aid in registering these rare conditions, yet it cannot always convey to the observer all the peculiar details of these exceptional lesions, nor can words sufficiently describe these anomalies.[159]

1819 J. F. K. Blvd.
Philadelphia, PA 19103

---

154. Program of the American Dermatological Association Meeting, 6–8 May 1913.

155. P. Mulzer, "Demonstration von Moulagen und Lichtbildern Einiger Interessanter Fälle," *Archiv für Dermatologie und Syphilis,* 1930, *160*:72–77.

156. Hans Hipp, *Votivgaben* (Pfaffenhofen, Germany: W. Ludwig, 1984).

157. R. Bauer and C. Stölzl, *Wachszieher und Lebzelter in alten München Sammlung Ebenböck* (Munich, Germany: München Stadtmuseum, 1981).

158. Stühmer, "Zuvil Morphologie?"

159. James Frank Wallis, "Wax Models of Unusual Types of Skin Diseases," *Transactions of the Section on Cutaneous Medicine and Surgery of the American Medical Association,* 1902:183–188.

Asepsis and the Transformation of Surgical Instruments

JAMES M. EDMONSON

Introduction

Medical museums and private collections contain intriguing evidence of the adaptation of surgery to asepsis. This evidence comes in physical as well as written or printed form and includes sterilizers, white enameled furniture, and the entire range of surgical instruments. In a general sense, it is known when this change occurred; some time between 1880 and 1900 instrument makers began to offer new models of surgical instruments in their catalogues.[1] These new models differed from pre-aseptic instruments in at least two important respects. First, plating and all-metal construction supplanted traditional materials that could not withstand either the corrosive action of disinfectants or the high temperatures of steam sterilization or autoclaving. Second, instruments were designed for easy disassembly, in order to make the task of cleaning them simpler and to assure their complete sterilization. While we can thus identify the most apparent changes of instruments in response to asepsis, we know comparatively little about how or by whom these changes were accomplished. Documentation of these changes, especially regarding the introduction of new forms of instrument locks or joints, is the purpose of this paper.

Plating of Instruments

After Louis Pasteur advocated the use of heat for sterilization and Joseph Lister introduced disinfectants, instrument makers realized that they would have to find different materials for the instruments

1. For an overview of these changes, see John Kirkup, "Thermal Sterilization and the Surgical Instrument Revolution," forthcoming in the journal of the Belgian Medical History Society; James M. Edmonson, "Charles Truax, *The Mechanics of Surgery,* and the Development of the American Surgical Instrument Industry," introduction to the reprint edition of Charles Truax, *The Mechanics of Surgery* (San Francisco: Norman Publishing, 1988), pp. vi–xliii; and James M. Edmonson and F. Terry Hambrecht, "George Tiemann & Co., the American Armamentarium Chirurgicum, and the American Surgical Instrument Trade," introduction to reprint of 1889 edition of George Tiemann & Co., *American Armamentarium Chirurgicum* (San Francisco: Norman Publishing, 1989), pp. 1–65.

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 75-91
© 1991 by The College of Physicians of Philadelphia.

they produced. Some answers were already at hand, in the form of plating metal surfaces that would otherwise rust or corrode after contact with boiling water, steam, or disinfectants. Electroplating processes became available in the early 1840s and instrument makers in Europe and America originally used electroplating to embellish instruments long before antiseptic and aseptic practices came into vogue. For example, Joseph Frédéric Benoît Charrière (1803–1876), a leading surgical instrument maker of Paris, announced in March 1842 that he had "gilded by M. De Rustz' process a considerable number of surgical instruments and pieces of cutlery," and that "the silver and the platinum plating, applied in the same manner, affords the same results as the gilding."[2] In America similar experiments with the plating process were underway. In 1843 George Tiemann of New York advertised that "he also attends to Galvanic Gilding and Silvering, which he will execute in the best manner, and on the most reasonable terms."[3] Instrument makers of this period were not oblivious to advantages of plating other than providing a decorative finish. A Boston medical journalist, reporting on the electroplating of surgical instruments by Daniel Davis, observed that "the advantages of the gilding must be obvious: they will not rust afterwards, and all know how much difficulty is ordinarily experienced in keeping them from rust. Even when forgotten after using — no uncommon circumstance — no harm comes to them, when prepared in this way, either by blood or water, or even long atmospheric exposure."[4]

Plating with gold, silver, and platinum was expensive, however, and instrument makers sought other metals that offered comparable protective virtues at less cost. Nickel proved an acceptable substitute for the precious metals, but was not used widely until Isaac Adams of Boston perfected the process of nickel plating in the mid-1860s.[5] Plating on a commercial basis, under license to Adams's patented processes, began a few years later and in the early 1870s the output of plating establishments increased significantly when Edward Wes-

---

2. "On Gilding of Surgical Instruments. By M. Charrière," *Medical Examiner*, 1842, *1*:548.

3. [Advertisement] "Surgical Instrument Maker. Geo. Tiemann, . . ." in John Doggett, Jr., editor, *The New York City Directory and Co-Partnership Directory for 1843 & 1844*.

4. "Gilding Surgical Instruments," *Boston Medical and Surgical Journal*, 1842, *27*:158–159.

5. F. B. Howard-White, *Nickel: An Historical Review* (New York: D. Van Nostrand, 1963), p. 109.

ton of England substituted the dynamo for galvanic batteries.[6] Nickel-plating of surgical instruments, prompted by the adoption of antiseptic principles, became more widespread in the mid-1870s. J. H. Thompson, in his review of the Tiemann displays at the 1876 Centennial Exhibition in Philadelphia, observed that "most of the steel instruments were nickel-plated, which is a great improvement, preventing rust and enabling the operator to keep his instruments clean with comparatively little care."[7] Plating was not without its limitations, however. Plating, under hard or long term use, or if inexpertly done, would start to flake off. In addition, plating did not overcome a basic problem: the retention of septic matter in the joints and articulations of instruments, particularly in the lock area of forceps and scissors. For this reason, surgeons and instrument makers started to revise the design of the scissor joint or lock, which traditionally employed a pivot screw. In its place they substituted various ingenious lock mechanisms, all fashioned to facilitate ready disassembly of instruments for sterilization.

Aseptic Instrument Lock[8]

One of the first notable public displays of aseptic instruments took place at the Universal Exposition of 1889 in Paris. Paul Berger, author of the official report on the medical and surgical exhibits, commented that,

> . . . it is impossible not to be struck by the complete transformation that surgical instrument making has undergone in the past few years. This renovation of our instrumentation was the consequence of the revolution that antisepsis introduced in surgical practice; it has been necessary to create entirely new

---

6. The Weston dynamo-powered process is described in Condit, Hanson & Van Winkle, *New Catalogue of Nickel and Electro-plating and Electrotyping Chemicals and Apparatus* (New York, 1879), pp. 4–9.

7. J. H. Thompson, "Group XXIV. Medicine, Surgery, Prothesis," in United States Centennial Commission, International Exhibition, 1876. Francis A. Walker, editor, *Reports and Awards. Vol. VII. Groups XXI–XXVII* (Washington: Government Printing Office, 1880), p. 62.

8. Strictly speaking, the appropriate term is "aseptible," as coined by Charles Truax, but both contemporaries and historians have taken to using "aseptic." See Edmonson, "Charles Truax," p. xxix.

> equipment that meets and exceeds the conditions that surgeons consider essential.[9]

Berger went on to describe in detail the individual exhibitors' contributions to the renovation of surgical instruments and equipment. Of special note, according to Berger, were the various designs for scissor-like joints or locks that French instrument makers had devised.

Berger was not alone in emphasizing instrument locks. In a series of articles published in *Le Progrès Médical* in 1889, Marcel Baudouin described in considerable detail the changes introduced by French instrument makers, particularly those in Paris.[10] In that city a small number of firms — Collin, Mathieu, Mariaud, Aubry, and Luer — dominated the national output of surgical instruments. These instrument makers, all of whom had worked for or with Charrière, the industry's undisputed leader, constituted an active community whose level of inventiveness and innovation was quite high.[11] In 1889 and for some time before that, according to Baudouin, these firms seemed to be preoccupied with the redesign of instrument locks.

This preoccupation was also noted by Léon Audain in Guillaume Emile Mergier's analytical monograph on the Universal Exposition of 1889, *Technique Instrumentale Concernant les Sciences Médicales.*[12] Audain identified three technical developments as central to the advance of surgery in the nineteenth century. He included: 1) the discovery of anesthetic agents and the subsequent development of anesthetic apparatus; 2) the introduction of antisepsis and its associated paraphernalia (sprayers for disinfectants, ster-

---

9. "Classe 14. Médecine et Chirurgie. Rapport du Jury International par M. Paul Berger," in Ministère du Commerce, de l'Industrie et des Colonies, Exposition Universelle Internationale de 1889 à Paris, *Rapports du Jury International Publiés Sous la Direction de M. Alfred Picard* (Paris: Imprimerie Nationale, 1891), Groupe II, 2e partie, pp. 564–565.

10. Marcel Baudouin, "La Médecine et les Sciences qui s'y rattachent à l'Exposition Universelle de 1889," *Le Progrès Médical*, 1889, *9*:463–465, 504–505, and *10*:55–59, 77–79, 101–105, 225–226, 239–241, 255–258, 288–291, 301–303, 328–330, 349–353, and 365–370.

11. See Urs Boschung, "Joseph-Frédéric-Benoît Charrière (1803–1876): Paris Surgical Instrument Maker from Switzerland," [trans. James M. Edmonson] *Caduceus*, 1988, *4*:34–46.

12. See especially the section "Chirurgie," by Léon Audain, in Guillaume Emile Mergier, *Technique Instrumentale Concernant les Sciences Médicales: Revue des Méthodes et Instruments Usités en Chirurgie, Micrographie, Physiologie, Hygiène, etc.* (Paris: Octave Doin, 1891), pp. 19–50.

ilizers, etc.); and 3) the invention of more effective means for hemostasis, particularly the artery forceps. In his discussion of artery forceps, Audain, like both Berger and Baudouin, reported at length upon instrument makers' efforts to devise a new form of instrument lock that could be disassembled readily for cleaning. Specifically, they all were attempting to improve upon a form of instrument lock introduced by Charrière in the 1850s and adopted by Jules-Emile Péan for his artery forceps in the mid 1860s. Why, one might ask, did this aspect of instrument design generate such interest?

Instrument makers devoted their efforts to this detail because they foresaw an unprecedented commercial opportunity. In light of the fact that surgical instruments had to be altered in compliance with the dictates of asepsis, all instrument makers stood to profit as physicians and surgeons discarded their existing (and henceforth unacceptable) instruments in favor of the new. If, however, any one instrument maker devised and patented an indisputably superior form of aseptic instrument lock, that individual could attain an immense advantage over competitors. In addition to manufacturing and selling instruments incorporating such an improvement, the innovator could derive revenues, through licensing and royalties, from all other makers who would be compelled by customer demand to adopt a particular form of lock or joint. This position of dominance would be compounded by the fact that this single design change would be applied across the spectrum of instruments featuring scissor-like action, including forceps, scissors, and other such implements. Given these prospects, the chase was on to devise and patent the lock or joint that would win the day.

In France, the first instrument maker to file a patent for a new aseptic lock was Adolphe Collin, successor to Joseph Charrière. Collin presented his initial model, patented on 30 October 1886, as an improvement upon the widely used mortise and tenon lock first introduced by Charrière.[13] He observed that the Charrière lock required considerable precision fitting, both in manufacture and

13. "Brevet no 179361, en Date du 30 Octobre 1886, à M. Collin, Pour un Systeme d'Articulation Applicable aux Pinces, aux Ciseaux et en Général à tous les Instruments à Branches Articulées," in Ministère du Commerce et de l'Industrie, *Description des Machines et Procédés Pour Lesquels des Brevets d'Invention ont été pris sous le Régime de la Loi du 5 Juillet 1844 Publiée par les Ordres de M. le Ministre du Commerce et de l'Industrie* (Paris: Imprimerie Nationale, 1889), 1886, *59*:pt. 2, 18–19, pl.vi. Hereafter cited as *Description*, with appropriate volume, year of patent (not publication date), and pages.

during assembly and disassembly before and after use. Moreover, frequent usage often resulted in wear and abrasion, so that the lock soon became loose and wobbly (see Fig. 1a).

To remedy these design faults, Collin substituted a straight pin for the mortise and tenon. To hold the instrument halves together, he added an overlapping finger or branch. One simply joined the instrument halves at right angles to each other, and then rotated them, as one would when closing a pair of scissors. As the handles came together, the finger placed below the pivot pin held the instrument halves securely in place. This finger proved to be the "weak link" of the Collin design; its slender form was not strong enough to guarantee both a tight fit and a smooth action.

Not discouraged by this apparent failure, Collin patented a second lock on 13 September 1887. This model, which also proved defective in use, consisted of a modified mortise and tenon lock. Collin quickly moved on to a third design, which he patented on 6 December 1887. In this version, Collin returned to his original straight pivot pin and overlapping finger. This time Collin placed the finger above the lock axis and reinforced it, so that it more closely resembled a yoke or cradle, not a mere finger. In this, his final design, Collin achieved both a snug, secure fit of the two instrument halves, and a smooth opening and closing motion when grasping an artery or tissue (see Fig. 1b).[14]

Collin was not the only instrument maker in Paris to patent new aseptic instrument locks. At least two competitors, Mariaud and Mathieu, patented their own designs between 1887 and 1890 (see Figs. 2a and 2b). Mariaud, like Collin, devised several different lock forms; in all, he patented five variants from June 1887 to July 1888 before settling upon his final model.[15] Similarly, Mathieu was not satisfied with his original aseptic lock of 1888 and filed addi-

---

14. For description and illustrations see Baudouin, "La Médecine," *Le Progrès Médical*, 1889, *9*:465, and *10*:55; and Mergier, *Technique Instrumentale*, pp. 32–33. Collin was apparently so pleased (or obsessed) with his lock design that he tried to utilize it whenever possible, even when it was neither called for nor especially helpful. One example of Collin's inability to restrain himself is in the application of the lock to an intubation tube introducer. See "Brevet no. 243456, en Date du 7 Décembre 1894, à M. Collin, Pour un System d'Instrument Pour Poser les Tubes Servant à l'Intubation du Larynx," *Description*, 1894, *91*:pt. 2, 18, pl.iii.

15. "Brevet no. 184318, en Date du 18 Juin 1887, à M. Mariaud, Pour un Nouveau System d'Articulation Pour les Pinces, Ciseaux et Autres Instruments à Plusieurs Branches," *Description*, 1888, 67:pt. 2, 2–4, pl.i. See also Baudouin, "La Médecine," *Le Progrès Médical*, 1889, *10*:255, and Mergier, *Technique Instrumentale*, pp. 29 and 32–33.

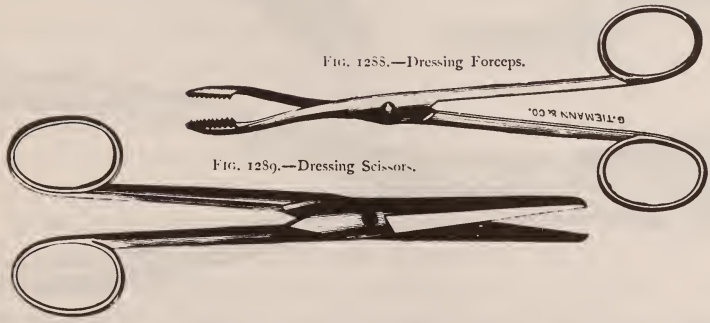


Figure 1a. Dressing forceps, with Charrière mortise and tenon lock and traditional screw lock. From George Tiemann & Co., *American Armamentarium Chiurgicum* (New York, 1889), p. 76.
Courtesy of the Dittrick Museum of Medical History.

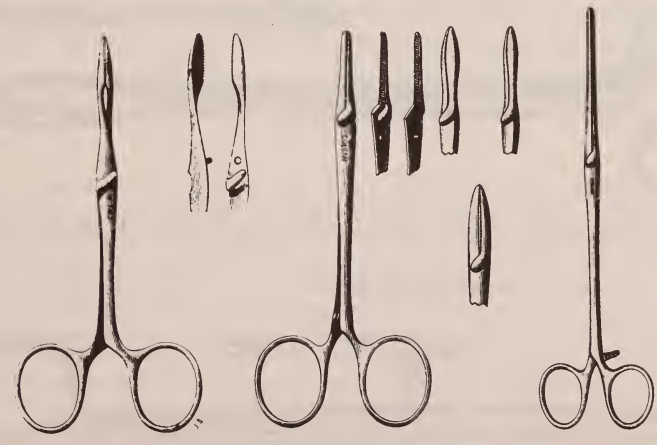


Figure 1b. Pinces hémostatigues nickelées avec articulation de Collin. From Collin, Maison Charrière, *Catalogue Général Illustré d'Instruments de Chirurgie* (Paris, France, 1890), p. 121.
Courtesy of the Dittrick Museum of Medical History.

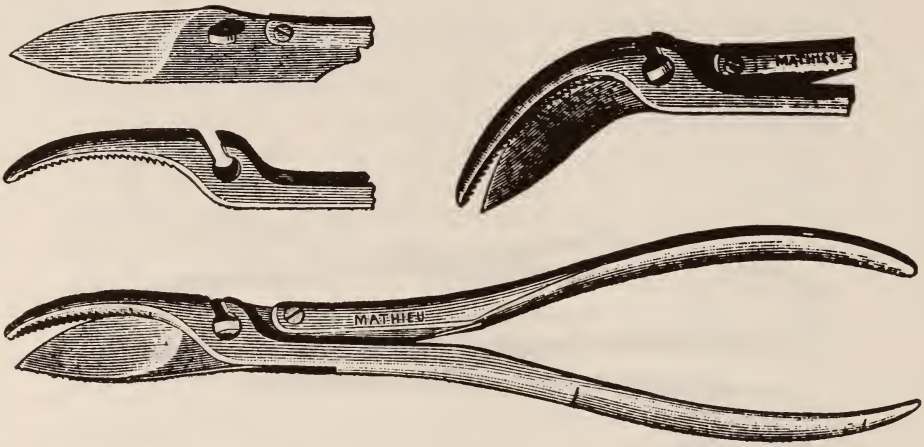


Figure 2a. Mathieu lock. From *Le Progrès Médical*, 1889, 2nd series, *10*:102.
Courtesy of the Dittrick Museum of Medical History.

Figure 2b. Mariaud lock. From *Le Progrès Médical*, 1889, 2nd series, *10*:255.
Courtesy of the Dittrick Museum of Medical History.

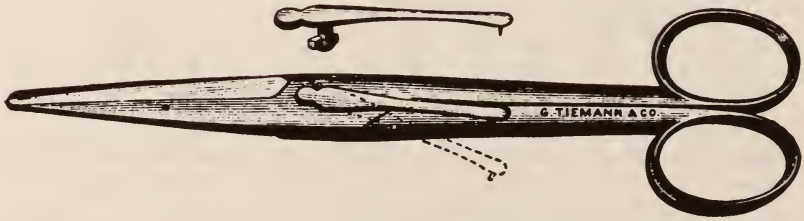


Figure 2c. Jones lock. From *New York Medical Journal*, 1888, *17*:332.
Courtesy of the Dittrick Museum of Medical History.

tional patent specifications in 1890, modifying the design one last time.[16]

As one can see, French patent activity of the late 1880s, especially in 1887 and 1888, provides evidence of a scramble to come up with the aseptic instrument lock that would become the international standard throughout the surgical instrument industry. If the evidence found in museum collections is to be trusted, it is apparent that none of the French patented designs became the accepted standard in markets that were not already dominated by the French industry.[17] In France, and in countries where French surgical instruments were preferred, the Collin model prevailed.

In the United States, physicians and surgeons were keenly interested in the development of aseptic instruments and put forth a variety of new lock forms in the late 1880s and early 1890s. For example, in 1888 Charles Noah Dixon Jones of Brooklyn, New York, introduced a new aseptic instrument lock (see Fig. 2c).[18] Jones had previously presented the Collin lock in an article on sterilization of instruments and surgical dressings by heat, but he had grown dissatisfied with it.[19] To overcome the design defects of the Collin lock, he designed an improved model and had it produced by George Tiemann & Co. It featured a separate detachable pivot pin held in place by a spring. To take apart the instrument halves for sterilizing, the surgeon unclipped the retaining spring and removed the pivot. When another surgeon, William H. Wathen of Louisville, Kentucky, presented Tiemann-made gynecological instruments featuring an

---

16. "Brevet no. 193072, en Date du 19 Septembre 1888, à M. Mathieu, Pour un System d'Articulation à Chape et Coulisse, Applicable aux Pinces, Cisailles et Ciseaux de Chirurgie et de Coutellerie," *Description,* 1888, *67*:24–26 and pl. vii. See also Baudouin, "La Médecine," *Le Progrès Médical,* 1889, *10*:102 and 104, and Mergier, *Technique Instrumentale,* pp. 33–34 (description only).

17. Some American instrument makers did begin featuring the Collin joint in their product lines beginning around 1889. See John Reynders & Co., *Illustrated Catalogue and Price List of Surgical Instruments* (New York, 1889), p. 197F, fig. 49; Sharp & Smith, *Catalogue of Sharp & Smith, Importers, Manufacturers, Wholesale and Retail Dealers in Surgical Instruments* (Chicago, Ill., 1889), pp. 314–315, fig. 1273; Max Wocher & Son, *Illustrated Catalogue and Price List of Max Wocher & Son, Manufacturers and Importers of Surgical Instruments and Orthopaedic Appliances* (Cincinnati, Ohio, 1891), p. 34, fig. 317; and E. A. Yarnall Co., *Surgical Instruments, Orthopedic Appliances, Trusses, Etc.* (Philadelphia, Pa., 1892), p. 18, figs. 219 and 220.

18. Charles Noah Dixon Jones, "A New Antiseptic Scissors and Forceps Lock," *New York Medical Journal,* 1888, *47*:332.

19. Charles Noah Dixon Jones, "The Preparation of Surgical Dressings by Sterilization With Heat," *New York Medical Journal,* 1888, *47*:151.

identical mechanism, Jones objected strenuously.[20] He contended that Wathen had appropriated his lock and he redressed Wathen for not "taking the trouble to acknowledge its authorship." Wathen responded that he had never claimed the lock as his own. Moreover, he pointed out to "the punctilious Dr. Jones" that his lock was in fact virtually identical to one that had appeared in *Illustrierte Monatsschrift der Ärztlichen Polytechnik* and was patented (patent no. 40,642) in Germany.[21] Jones politely thanked Wathen for bringing this fact to his attention and he professed no prior knowledge of the German design.[22] Although Jones took out no patent upon his version of the device, it was marketed as his invention by some instrument makers.[23]

In at least two respects, Jones's experience was representative of that of American physicians and surgeons involved in the development of antiseptic and aseptic instruments. First, he discovered that his design had a European antecedent. Other American doctors who developed aseptic instrument locks had similar experiences and include Howard A. Kelly, George M. Edebohls, George R. Fowler, and A. Ady.[24] In the case of each of these individuals, the mechanism they designed did not prevail, apparently in part because "better" forms of the aseptic lock had been contrived and produced in Europe already. Perhaps these doctors simply started paying attention to the minutiae of aseptic practices too late to make an impact on the instrumentation. Second, even though the design seemed original and had merit, Jones made no effort to patent the design. In his case, Jones was undoubtedly discouraged from doing so when he learned of the prior German patent on a similar lock mechanism. This was not the only nor the most compelling reason for his inaction, however. Before the present century the patenting of surgical devices was not considered to be professionally "proper." The first Code of Ethics of the American Medical Association, adopted in

20. William H. Wathen, "Uterine Dilator," *New York Medical Journal,* 1888, *48*:220–221; and Charles Noah Dixon Jones, "The Antiseptic Lock for Scissors and Forceps," *New York Medical Journal,* 1888, *48*:326.

21. William H. Wathen, "The Antiseptic Forceps Lock," *New York Medical Journal,* 1888, *48*:494.

22. Charles Noah Dixon Jones, "The Antiseptic Forceps Lock," *New York Medical Journal,* 1888, *48*:552.

23. See Sharp & Smith, *Catalogue,* p. 313.

24. George M. Edebohls, "An Improved Antiseptic Lock for Surgical Instruments," *Medical Record,* 1890, *37*:310; on Fowler and Ady, see Sharp & Smith, *Catalogue* (1889), 324–325; and on Kelly see Hunter Robb, *Aseptic Surgical Technique* (Philadelphia, Pa.: J. B. Lippincott, 1894), pp. 69, pl. iii.

1847, specifically forbade it, stating that, "equally derogatory to professional character is it for a physician to hold a patent for any surgical instrument or medicine."[25] Not all physicians and surgeons obeyed this ruling, but a review of the medical and surgical device patents for the period from 1880 to 1895 reveals that the leading medical men of the day did. So, it was left to the instrument makers to devise and patent much of the instrumentation required for aseptic surgery.

In America, the first aseptic lock to be adopted widely was the so-called "open-box" instrument joint. This resembled a cross between the Collin lock and the Edebohls lock. Instrument handles were joined at a 90-degree angle, with the insertion of the plain pivot pin, and as they closed overlapping guards held the halves in place. To date, the surgeon or instrument maker responsible for this lock pattern has not been identified. It is clearly an American innovation, however, first appearing in the 1890 catalogues of the major surgical instrument firms, including Sharp & Smith and Charles Truax & Co., both of Chicago (see Fig. 3a).[26] In the next few years, other large instrument makers followed suit, including Wm. H. Armstrong of Indianapolis and Chas. Willms Surgical Instrument Co. of Baltimore.[27] Just as the "open box" lock seemed to be catching on, it was displaced by a design that soon became the international standard.

The lock design that achieved this distinction is first found among French patent records in 1891. On 2 July 1891, a patent, or *brevet*, was granted to "M. Henger, for pincers, scissors and analogous instruments composed of two separable parts."[28] This lock,

---

25. "Code of Ethics," *Transactions of the American Medical Association*, 1864, *14*:334. The impact of the patent system upon nineteenth-century American medicine and surgery has yet to receive the serious attention it deserves. To my knowledge, the best guides to historical research in patent records are Eugene S. Ferguson, *Bibliography of the History of Technology* (Cambridge, Mass.: M.I.T. Press, 1868), pp. 102–109, and Rodris Roth, "Nineteenth-Century American Patent Furniture," in David A. Hanks, *Innovative Furniture in America from 1800 to the Present* (New York: Horizon Press, 1981), pp. 5–31, and 191–192.

26. Sharp & Smith, *Catalogue*, p. 501A, and Charles Truax & Company, *Price List of Physicians' Supplies*, 5th ed. (Chicago, Ill., 1890), p. 700.

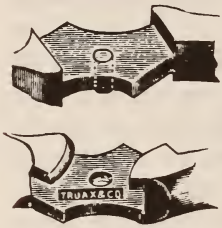
27. Wm. H. Armstrong, *Catalogue, Illustrations and Prices of Surgical Instruments, . . .* , 3rd ed. (Indianapolis, Ind., 1894), p. 66, and Chas. Willms Surgical Instrument Co., *Illustrated and Descriptive Catalogue and Price-List of Surgical Instruments, . . .* (Baltimore, M.D., 1895), p. 42.

28. "Brevet no. 214597, en Date du 2 Juillet 1891, à M. Henger, Pour Pinces, Ciseaux et Instruments Analogues Formés de Deux Parties Separables," *Description*, 1891, *79*:pt. 2, 19, pl. iv.

700

TRUAX & COMPANY

AMPUTATING AND GENERAL OPERATING INSTRUMENTS.



PATENT APPLIED FOR.

TRUAX'S ASEPTIC "OPEN BOX JOINT."

There is perhaps no class of instruments more difficult to thoroughly cleanse than the ordinary forms of Forceps. Nearly all forms of Bone and Tooth Forceps have heretofore been constructed with closed joints, that not only afforded a safe deposit for disease germs, but furnished a good medium for conveying them from one patient to another. Our open box joint is not only thoroughly aseptic, but it is as strong as the ordinary pattern. It may be unjointed in a second or two and as quickly put together. It combines all the necessary requisites in a perfect-working desirable instrument, and customers need have no hesitancy in ordering instruments constructed with our "Open Box Joint."

Figure 3a. Open box lock. From Charles Truax & Co., *Price List of Physicians' Supplies* (Chicago, Ill., 1890), p. 700.
Courtesy of the Dittrick Museum of Medical History.

1098

CHAS TRUAX GREENE & CO

AMPUTATING AND GENERAL OPERATING INSTRUMENTS.

PATENT JOINT FOR FORCEPS AND SCISSORS.

There is perhaps no class of instruments more difficult to thoroughly cleanse than the ordinary forms of Forceps. Nearly all forms of Bone and Tooth Forceps have heretofore been constructed with closed joints, that not only afforded a safe deposit for disease germs, but furnished a good medium for conveying them from one patient to another. Our Patent joint is not only thoroughly aseptible, but it is as strong as the ordinary pattern. It may be unjointed in a second or two and as quickly put together. It combines all the necessary requisites in a perfect-working desirable instrument, and customers need have no hesitancy in ordering instruments constructed with our patent joint.

Figure 3b. Aesculap lock. From Truax, Greene & Co., *Price List of Physicians' Supplies* (Chicago, Ill., 1893), p. 1098.
Courtesy of the Dittrick Museum of Medical History.

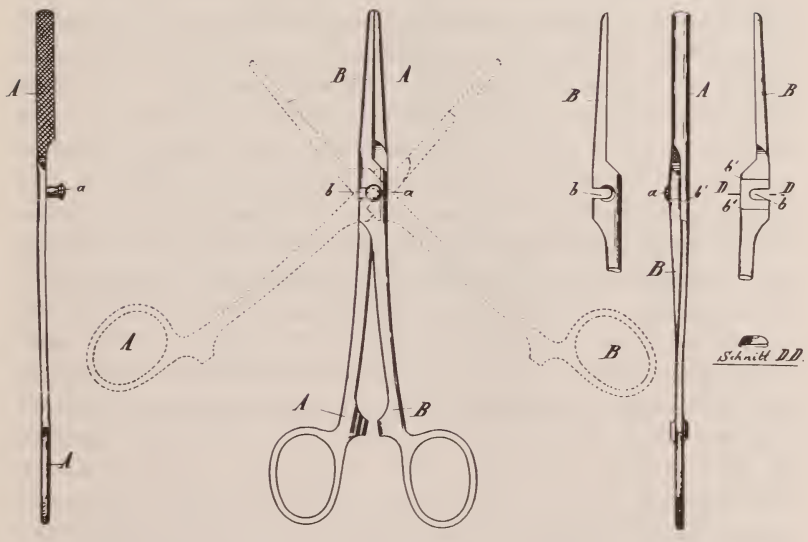


Figure 4. Paul Henger und Dr. Med. Gustav Walcher in Stuttgart. Verschluss fr Zerlegbare Zangen, Scheerer u. Dergl. Patentiert in Deutchen Reich vom 27 Marz 1891. From Kaiserliches Patenamt. Patentscrift Nr. 59030–Klasse 69. Ausgegenen de. 29 September 1891.
Courtesy of the Dittrick Museum of Medical History.

subsequently known as the "Aesculap" lock, was patented in Germany by Paul Henger and Gustav Walcher of Stuttgart on 7 March 1891 (see Fig. 4), in England on 29 May 1891, and in the United States on 3 May 1892.[29] By 1893 at least one leader of the American surgical instrument trade, Charles Truax, would abandon the open

29. In Germany, "Paul Henger und Dr. med. Gustav Walcher in Stuttgart, Verschluss für Zerlegbare Zangen, Scheerer u. dergl. Patentiert im Deutschen Reich vom 27 Marz 1891, Patentschrift Nr. 59030"; and for the United States, "Paul Henger, of Stuttgart, Germany. Surgical Instrument. Specification Forming Part of Letters Patent No. 4474130, Dated May 3, 1892."

box lock and instead feature the "Aesculap" lock in his trade catalogue (see Fig. 3b).[30] In the ensuing decade it emerged as *the* preferred and dominant form of aseptic instrument lock. Why, one might ask, did the "Aesculap" lock win out over the many other designs proposed by surgeons and instrument makers?

The "Aesculap" aseptic lock is a simple, elegant solution to the challenge of designing a lock for easy assembly and disassembly. To assemble the instrument handles, one grasped the half with a chamfered slot and engaged the flat-headed pivot pin of the other half at right angles. A slight twist of the wrist and the two handles snapped in place and the instrument was ready for use. It came apart again by simply reversing the motion. One American firm adopting the "Aesculap" lock explained that "this lock possesses the following advantages over all locks heretofore put on the market: it is absolutely unbreakable; it is thoroughly aseptic; and it is disjointed and re-assembled more readily than any other lock."[31] However, contrary to these assertions, it is not markedly more ingenious in form or effective in use than the "open box" lock or the designs of Collin or Mariaud. Instead, it appears that the principal advantage it offered was that of being more easily produced by machine, by drop-forging in particular. This proved to be a decisive factor, since surgical instrument making was shifting rapidly from workshop to factory. Mechanical, machine-based methods of production became central to the success of a few large instrument makers beginning in the 1880s, so that by the turn of the century a handful of firms dominated the market for surgical instruments on both sides of the Atlantic.[32]

---

30. Between 1890 and 1893 Charles Truax shifted to the "Aesculap" lock, as illustrated in the "Columbian edition" of his firm's catalogue. See Truax & Co., *Price List,* p. 700, and Charles Truax, Greene & Co., *Price List of Physicians' Supplies,* 6th ed. (Chicago, Ill., 1893), p. 1098.

31. "The Famous K. S. Co.'s Aseptic Unbreakable Lock," *The Yarnall Surgical Co.'s Bulletin,* 1900, *1*:1.

32. Marcel Baudouin, in his opening remarks on the 1889 Universal Exposition displays of surgical instruments [published in *Le Progrès Médical,* 1889, *9*:464], noted this shift from small workshops, or *ateliers* in Paris to factories in provincial centers of industry:

> We will take this occasion to point out a new tendency that increasingly pronounced among surgical instrument makers and that does not seem to us, on the whole, an improvement. In this industry as in many others, man is steadily being displaced by machine [*la machine à vapeur,* or steam engine]; the *artiste,* the skilled workman, no longer exists in this quintessentially French branch of cutlery. Most of our makers have their instruments made in provincial centers by

By 1900 the undisputed leader among instrument making firms was the Jetter & Scheerer enterprise, headed by Wilhelm Scheerer, in Tuttlingen, Württemberg. Scheerer's success can be explained in great measure by the mechanization of production at his factory, today known as the Aesculap-Werke AG.[33] In the 1890s, and perhaps earlier, Scheerer introduced steam activated drop forging to replace hand forging in the manufacture of knives, scissors, and forceps. This change increased output dramatically. By hand a skilled workman could produce about 60 to 75 forgings in a day; by semi-automatic drop forge an adept person could turn out 1,200 to 1,500 forgings in the same period.[34]

In addition to increasing productivity in his factory in Germany, Scheerer extended his marketing network overseas, to the United States in particular. By 1898 he had formed the Kny-Scheerer Corporation in association with Richard Kny, manufacturer and importer of surgical instruments and physicians' supplies in New York.[35] This company served as the principal distributor of Scheerer's instruments, but was also supplemented by a chain of retailers that sold Kny-Scheerer instruments under their own names.[36] Later, after the turn of the century, the Kny-Scheerer Corporation also

---

> ordinary workmen, in vast industrial establishments that mass produce, quickly and cheaply, but ordinarily their output is limited to things [table cutlery] other than amputation knives. Of course, labor is costly in Paris, and to make a greater profit it is better to utilize this provincial work force. Of course, one thus gets instruments of a notably lower price. But the problem is that the products of our French firms are not very much better, and they once were, than those made abroad; everything is leveling out, democratizing, even in the field of surgical instruments.

33. For a history of the firm, see "Aktiengesellschaft für Feinmechanik," in Jetter & Scheerer, *1867–1967: 100 Jahre im Dienst der Medizin* (Tuttlingen, Germany: Jetter & Scheerer, 1967).

34. U.S. Tariff Commission, *The Surgical Instrument Industry in the United States,* Tariff Information Series No. 7 (Washington, D.C.: Government Printing Office, 1918), p. 34.

35. Richard Kny began business in New York around 1888, formed Richard Kny & Co. in 1891 to import aseptic hospital furnishings from Germany, and became the New York affiliate of Jetter & Scheerer in 1898. See Richard Kny & Co., *Aseptic Operating Furniture of Iron and Glass, Manufactured by Richard Kny & Co.* (New York, 1894 [?]), and *Descriptive Catalogue No. 3 of Aseptic Furniture, Operating Tables, Sterilizing Apparatus, and Sick-Room Utensils* (New York, 1896).

36. Examples include W. Brunet & Co. (Quebec, Canada), Feick Brothers Co. (Pittsburgh, Pa.), Manhattan Surgical Instruments (New York), Matthay Hospital Supply Co. (Los Angeles, Calif.), Roemer Drug Co. (Milwaukee, Wis.), Schuemann-Jones Co. (Cleveland, Ohio), Wayne Pharmaceutical Supply Company (Fort Wayne, Ind.), and H. W. Weed (Syracuse, N.Y.).

opened a factory in Newark, New Jersey, to produce instruments in the United States.

The chief guarantee of Kny-Scheerer's business fortunes was based upon the role it played in supplying hospitals with aseptic furnishings, from autoclaves to instruments. Richard Kny & Co. had already established a firm position in this area as principal supplier of the "Sprague Standard Sterilizer," and other associated equipment for sterilizing instruments and dressings. Developed by Austin V. M. Sprague, inventor, tinkerer, and erstwhile engineer, Sprague sterilizers and disinfectors would be the most widely used aseptic apparatus at the turn of the century.[37] In addition, Kny-Scheerer controlled the patent rights for the "Aesculap" aseptic lock. Evidence of the importance of this control is found in the instruments themselves. Beginning in 1909, tariff regulations stipulated that all imported products had to be marked with the country of origin. Surgical instrument retailers in America obtained exemption from this requirement, arguing that the recesses of stamped markings could harbor septic matter and that "would make proper sterilization impossible."[38] Kny-Scheerer ignored this ruling and persisted in stamping the "Aesculap" trademark on its instruments. Furthermore, it took special care to add the markings "Patented" and "Pat.5.3.92" (the American patent date) on instruments incorporating the "Aesculap" lock. These markings usually appeared on the inner face of the lock, where septic matter was most likely to accumulate. In doing this, Kny-Scheerer permitted commercial interests to take precedent over aseptic precaution. This tangible evidence demonstrates, I believe, the perceived importance of the "Aesculap" lock among instrument makers.

Conclusion

In summary, this brief review of instrument makers' response to asepsis reveals that they played a central, if often neglected, role in the transformation of surgical instruments. They approached the problem by devising what I would call "transcendent" solutions; that is to say, they sought out solutions or improvements that could be applied across a broad range of the instrumentation that they produced. With this approach to the problem in mind, they quickly

37. See list of institutions using Sprague equipment in Kny-Scheerer Co., *Catalogue of Modern Hospital Supplies* (New York, 1902), pp. 264–265.

38. U.S. Tariff Commission, *Surgical Instrument Industry,* p. 24.

focused upon the redesign of instrument locks. Since they were businessmen, their technical solutions embodied economic decisions. In the case of the "Aesculap" lock, an imperative design criterion was to make a lock mechanism that could be produced quickly and cheaply by machine. Their economic concerns even overrode medical ones, as illustrated by the stamping of trademarks and patent dates on instruments, even though aseptic precaution would have condemned this practice. Finally, this inquiry suggests that instruments makers in America played a comparatively minor part in this particularly important change in the surgeon's armamentarium; for the most part, they simply followed a European example. The success of European, particularly German, instrument makers in the design, production, and marketing of aseptic instruments and furnishings signaled the beginning of a long term decline in the fortunes of surgical instrument making in America.

Dittrick Museum of
Medical History
11000 Euclid Avenue
Cleveland, OH 44106

The Real Deficit: Child Health and Public Policy in the United States

ANN ROSEWATER

It is indeed a pleasure to speak at the College on the occasion of the induction of new Fellows because it combines an academic and a career interest — the history of art and the practice of policy for children and families. I will speak later about the fact that we have a long way to go to raise children and family policy to a high art.

In these quarterly gatherings, the College celebrates its tradition, passes on its legacy, and reaffirms its values. This resonates with a special meaning for me because I have been touched by the legacy of two of the College's presidents — Robert Austrian and Katherine Sturgis — both of whom are part of my family. Those values encompass an esteem for medical science and its historical advances, for applying scientific evidence to solving problems, and for using its clinical and research experience to foster the wellbeing of the larger community. In its induction of new Fellows, the College simultaneously recognizes prior achievement and looks to the future.

These proceedings consist of more than a celebration. They highlight the College's continuing efforts to reflect upon and refine the roles and responsibilities of physicians in society. "We are not merely physicians meeting to hear and discuss facts and theories," but to fulfill the duty of "incessant watchfulness of all public interests in which questions of public health are concerned."[1] These were the words of S. Weir Mitchell in 1888, and the dedication of members of the College to the public interest endures.

The College's continuing concern with the public interest is fitting — for its history and development are closely tied to that of the nation. Each sprang from a need to explore; each grew and prospered by breaking down barriers, both physical and intellectual; and each is rooted in a special optimism, one which perhaps manifested itself best in an ongoing belief that knowledge, skills,

---

This article was initially presented on 9 May 1990 as a lecture at the College of Physicians of Philadelphia on the occasion of College Night.

1. S. Weir Mitchell, "Annual Address," *Transactions of the College of Physicians of Philadelphia,* 1888, *10*:xxiv–xxv, as quoted in Whitfield J. Bell, Jr., "S. Weir Mitchell in the College of Physicians of Philadelphia," *Transactions & Studies of the College of Physicians of Philadelphia,* 1990, *12*:15.

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 93-105
© 1991 by The College of Physicians of Philadelphia.

and values were to be passed on and that the next generation would enjoy a better life than the one that preceded it.

College Nights demonstrate that for the College, there exists a healthy and vibrant corps of people who can continue to build upon the accomplishments and achievements of those who have come before them. But I wish to point out that although the College justly feels a sense of optimism about progress and renewal for itself, there is now little reason to believe that optimism has any meaning for much of the larger society. The reason for this is that a substantial number of America's children are at risk and, despite the fact that a wealth of information exists about how to improve the health and conditions of these children, we have not, as a nation, demonstrated effectively the will to do so.

While it is true for some children that they will grow taller, live longer, and live free of the diseases that afflicted their parents, this is only true for some. Millions of children in the United States have been, and are being, left behind. For much of our history, this could be regarded as individual misfortune. Today we no longer can delude ourselves that way. Our demography and economy have changed drastically in recent decades, and current misfortunes no longer remain only individual ones. Now, they threaten our viability and imperil our legacy.

I would like to talk to you about who are America's children today, the state of their health — broadly speaking — and what this implies. I will suggest that children's changing conditions arise not only out of economic and demographic shifts, but out of certain assumptions and premises which underlie policy, most of which no longer hold true. I would like also to consider not only that we now have a solid base of information on which to build an effective children's health policy, and that a consensus is building around need and possibilities, but also reasons why leadership from the medical profession is critical now to achieving this shared goal. While I may begin on a pessimistic note, by the end, I hope you will share not only a sense of urgency, but my sense of cautious optimism.

Children under the age of 18 are a decreasing portion of the population: in 1960, children comprised more than one-third of all

Americans; by the year 2030, little more than one-fifth of our population will be children.[2]

During the last decade, millions of children and their families actually lost ground economically. Since 1980, in spite of a general economic recovery, child poverty in the United States has escalated. Now, nearly 13 million American children are poor, making them the poorest of any group in our country.[3] Among children under age six, more than five million — or one out of every four — is poor.[4] The federal government defines a poor family of four as having an annual income of less than $12,675.[5] Can you imagine raising a family of four in Philadelphia on this income?

In Pennsylvania, a large, influential, and reasonably affluent state, children have shouldered a considerable portion of the child poverty that Senator John D. Rockefeller, chairman of the National Commission on Children, calls a "staggering personal and national tragedy."[6] Since 1979, child poverty has increased in Pennsylvania by one third, a clear demonstration that the rise in the number of poor children is not confined to poor states.[7] Even in the 1980 census, before the devastating recession and public disinvestment of this [past] decade, Philadelphia recorded an astounding 30 percent of its children in poverty.[8]

Minority children — who will soon comprise nearly one in four of the nation's youth — are also much more likely to grow up in low-income families: now, nearly 45 percent of black children

---

2. Select Committee on Children, Youth, and Families, of the U.S. House of Representatives, *U.S. Children and Their Families: Current Conditions and Recent Trends, 1989* (Washington, D.C.: Government Printing Office, 1989), Table I, p. 9; and Children's Defense Fund, *SOS America! A Children's Defense Budget* (Washington, D.C.: Children's Defense Fund, 1990), p. 150.

3. U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 168, *Money Income and Poverty Status in the U.S. 1989* (Advance Data from the March 1990 Current Population Survey) (Washington, D.C.: Government Printing Office, 1990), Table 22, p. 65.

4. Ibid. For a more detailed analysis of trends affecting children under age six, see also National Center for Children in Poverty, *A Statistical Profile of Our Poorest Young Citizens* (New York, N.Y.: Columbia University School of Public Health, 1990).

5. U.S. Bureau of the Census, *Money Income,* Table A-2, p. 86.

6. Senator John D. Rockefeller, III, 31 March 1990 statement on release of *Opening Doors for America's Children: Interim Report of the National Commission on Children* (Washington, D.C.: Government Printing Office, 1990).

7. Center for the Study of Social Policy, *Kids Count* (Washington, D.C.: Center for the Study of Social Policy, 1990), p. 44.

8. Children's Defense Fund, *SOS America,* p. 172.

and 37 percent of Latino children are poor.[9] What is increasingly apparent about children is that they are poorer than the rest of society and they are more likely to have ethnic and cultural identities which historically have not been well accepted as part of the American mainstream.

That children lost more than income in the last decade is nowhere more evident than in the state of their health. The context is one you know well: we spend a larger share of our Gross National Product on health care than any other nation in the Organization for Economic Cooperation and Development.[10] From some perspectives — and for some people — we have developed the most advanced medical care in the world. But millions of children are not receiving the benefits of either the expenditures or the advances. The data are voluminous; let me just highlight a few salient facts.

> After decades of extraordinary and global progress in saving very sick, premature, and underweight babies, still far too many babies are born too early and too small.
>
> The United States ranks nineteenth in infant mortality, behind Japan, Singapore, Hong Kong, and virtually all other industrialized nations, and our low birthweight rate has not shown improvement either.
>
> Black newborns in cities, including this one, die at rates rivaling those in the Third World.[11]

It is unlikely that we will soon see any improvement because hundreds of thousands of babies are now born drug-exposed every year. These children, some also infected with the AIDS virus, are further crowding urban, and some suburban, neonatal wards, draining already depleted resources, testing the compassion and the endurance of doctors, nurses, and other caregivers, and spilling into

---

9. U.S. Bureau of the Census, *Money Income,* Table 22, p. 65.

10. Organization for Economic Cooperation and Development, 1987.

11. Children's Defense Fund, *SOS America,* p. 139; Select Committee, *U.S. Children and Their Families,* Table 72, pp. 166–167; Children's Defense Fund, *SOS America,* p. 174. For additional statistical analyses of how American children fare compared to their peers in other nations, see Select Committee on Children, Youth, and Families, of the U.S. House of Representatives, *Children's Wellbeing: An International Comparison* (Washington, D.C.: Government Printing Office, 1990) and American Academy of Pediatrics, "Cross National Conference on Child Health," background papers, March 1990.

child welfare systems and schools which are unprepared to assist them.[12]

We once thought that if a child survived the first year of life, he or she would outgrow many problems, and that the risks of other problems would virtually disappear. But now it appears that, without prevention and treatment, as they get older, children face a continuum of risk, suggesting not only the persistent impact of early dysfunction, but also the precarious nature of communities and neighborhoods, and all too often, their own homes.

> We know that death rates for American children of all ages are higher than for their Western European counterparts, but injury — drowning, burns, handguns, and alcohol-related auto accidents — has replaced disease as the predominant cause. Among teenagers, three fourths of the deaths result from homicide, a sharply increasing trend.[13]
>
> Americans have been called "reproductively illiterate."[14] Nowhere is this illiteracy more apparent than in the teen pregnancy rate. In 1988, 489,000 teenagers gave birth — five thousand of them in Philadelphia — and nearly as many, four hundred thousand, had abortions.[15]

So it is apparent that millions of children, and poor children disproportionately, are victims of life-threatening events throughout their childhood, jeopardizing not only their physical health, but their educational readiness, their emotional development, and their family's stability. In some cases, these events may also affect their own children.

Children became more vulnerable at a time when mounting economic pressures — loss of higher paid manufacturing jobs and

---

12. Select Committee on Children, Youth, and Families, of the U.S. House of Representatives, *No Place To Call Home: Discarded Children in America* (Washington, D.C.: Government Printing Office, 1989), see especially Appendix VI, "Survey: Addicted Infants and Their Mothers."

13. C. Arden Miller, M.D., "Child Health: Lessons from Developed Nations," testimony before the Select Committee on Children, Youth, and Families, of the U.S. House of Representatives, 20 March 1990.

14. Louella Klein, M.D., "Prenatal Care: Who Gets It and Who Does Not," paper delivered at the Cornell University Medical College Sixth Annual Conference on Health Policies, "Improving the Life Chances of Children at Risk," New York, 15–16 February 1990.

15. National Center for Health Statistics, *Monthly Vital Statistics Report,* Vol. 39, No. 4 (Washington, D.C.: Government Printing Office, 1988); National Center for Health Statistics, *Supplement* (Washington, D.C.: Government Printing Office, 1990), Table II, p. 16; Children's Defense Fund, *SOS America,* p. 160; and Select Committee, *U.S. Children and Their Families,* Table 108, p. 249.

expansion of temporary, part-time, and lower-paying jobs in the services sector — made supporting a family increasingly difficult. At the same time, federal and state policies seriously exacerbated economic and demographic trends. Governmental supports and services were severely eroded. While the number of poor children increased, for example, the share of them receiving Aid to Families with Dependent Children (AFDC) — now little more than half — is lower than in 1980.[16] And the value of that assistance — which has never added up to a poverty level income — has further dwindled.[17] In Pennsylvania, one of the more generous states, the value of AFDC and food stamps, taken together, decreased to 68 percent of the poverty level.[18]

In addition, an astounding nine million women of childbearing age, and 12 million children, lack health insurance — 14 percent more than at the beginning of the decade.[19] The majority are from low-income or near-poor families in which the parents work, but neither receive employer-sponsored insurance nor qualify for Medicaid. Medicaid, like other American welfare programs, covers only about half of income-eligible children,[20] and for every child whom states added to the Medicaid program in the mid-1980s, two children lost private, employer-sponsored health insurance.[21] While we do not know all the reasons that children's circumstances deteriorated so dramatically, clearly there has been a failure of both public and private sector policy. The policy changes required to keep pace with the need, let alone prepare for emerging trends, have not occurred.

Why has this happened? Among other things, we failed to question — or recognize the validity of the challenge to — many long-held assumptions which were no longer valid. First, it has been a longstanding assumption that the family — traditionally a two-

---

16. Select Committee, *U.S. Children and Their Families,* Table 54, pp. 126–127.

17. Ibid., Table 116, p. 266.

18. Center for the Study of Social Policy, *Kids Count,* p. 44.

19. Alan Guttmacher Institute, *Blessed Events and the Bottom Line: Financing Maternity Care in the United States* (New York: Alan Guttmacher Institute, 1987); and P. A. Sealing, "Profile of Child Health in the United States," National Association of Children's Hospitals and Related Institutions, Alexandria, Virginia, 1989.

20. Select Committee, *U.S. Children and Their Families,* Table 118, pp. 270–271. In November 1990, during its final days, the 101st Congress enacted a major expansion of Medicaid. Effective 1 July 1991, states will be required to phase in coverage of all poor children under age 18 by the year 2001 (Sec. 4601, H. R. 5835, Omnibus Budget Reconciliation Act of 1990, P.L. 101-508).

21. Children's Defense Fund, *SOS America,* p. 73.

parent family with only one earner — served as primary caretakers of their children and had sufficient resources to purchase in the marketplace whatever care and shelter was needed. For some families this is still true.

Normative expectations of what caretaking roles will be assumed and when in the life-span have broken down. We now have the four-generation family — new parents who range from 12 or 14 years old to 45, and grandparents ranging in age from 35 to eighty-five. At the same time, in the past decade, in order to maintain family income, millions of parents, especially mothers with young children, entered the workforce.[22] And as the number of divorced and single parents — usually mothers — raising children alone also skyrocketed, the outcry for supports such as child care and workplace flexibility became undeniable.

Another too long unchallenged assumption was that, as imperfect as our systems of delivering health, education, and social services were, they were serving those most in need and any substantial reform of these systems would be too disruptive and too difficult. If health care is any example though, the system was already disrupted: services had become fragmented, complex, and inequitably distributed. Costs were escalating at an alarming and seemingly endless rate. Millions of private physicians, rebelling against high malpractice premiums, low and late reimbursements, and a high risk and unfamiliar caseload, were opting out of serving publicly insured patients, leaving them to expensive emergency rooms and clinics as a regular source of care. Fewer patients, especially pregnant women and children, were receiving even the most basic preventive measures such as prenatal care and immunizations. Similar dislocations, with similar results, had already afflicted both the education and social welfare systems, especially where the most vulnerable children were concerned.

During an era of high budget deficits, many clung to yet another assumption: that we lacked the resources to reach everyone in need. But the evidence was mounting: far from saving public money by slashing social programs, the harm created by cutting services and weakening protections proved much more costly. We were beginning to learn that the *real* cost savings would be achieved by selective investments in demonstrably effective services. Furthermore, even if the goals of a healthy, educated, and equitable life for our children

---

22. Select Committee, *U.S. Children and Their Families,* Table 31, pp. 76–77.

cannot be achieved on the cheap, finding the resources is not the problem. Again, the problem is a failure of policy and will.

Throughout most of the 1980s, those supposedly scarce resources had been dedicated to rewarding the defense establishment, and relieving a purportedly overtaxed citizenry. More recently, we need only look to the savings and loans to find out where these scarce resources are going. Each year the administration is requesting an *additional* $30 billion in spending to bail out these so-called thrift institutions. And more than $1 billion of fresh losses are occurring every month in savings and loan institutions which the government has not yet taken over. By comparison, the investment needed for children is a bargain.

A final assumption which is no longer correct is that even if people agreed on the goals, there was no consensus on how to reach them. But that is no longer true even with regard to one of the most difficult and sensitive issues — health care financing. If anyone believes that the current system of financing care, particularly for pregnant women and children, will exist a few decades from now, one thing that I can say from my years on Capitol Hill, is that just is not so. The issue has become a major and urgent one, though one that has yet to be resolved.

And there is a consensus for change evolving among employers, policy makers, and patients, and some in the medical profession. In California, even insurance companies and some major health maintenance organizations have presented new proposals. None of the approaches which have been put forward, and there are many, are identical, but all of them look toward fundamental change and most ensure coverage for all pregnant women and children.

Now, the needs of people — especially vulnerable children and their families — are reaching the top of the agenda for distinguished groups of business and university leaders like the Committee for Economic Development, as well as major philanthropies, such as the Ford Foundation; for the National Governors Association as well as mayors and county executives; and for a broad spectrum of professional groups as well as citizens across the country. And with the help of the National Academy of Sciences' Forum on the Future of Children, an unprecedented coalition of health and education professionals and practitioners has been established for the first time.

Even Congress is on the verge of enacting the most ambitious children's legislation in a decade: to expand and improve child

care and early education, and expand tax credits for working poor parents.[23] And in the early crafting of the fiscal 1991 budget, Congress again signaled its desire to shift priorities. In the face of the rapid transformation of Eastern Europe and the Soviet Union toward democratic institutions, Congress sought to scale back expensive and unnecessary defense expenditures and reinvest in the United States.

Where policies for children and youth are concerned, a very broad consensus has emerged not only because the needs have become so pervasive, and the pressure to remain competitive in the world economy so pressing, but also because we *do* know a lot about what works to improve children's wellbeing and give them a healthy start in life. We know that comprehensive prenatal care results in better outcomes for mothers and children, and averts later and more costly care. As early as fall 1989, then acting surgeon general James O. Mason testified that, at this time, we can save at

---

23. In November 1990, after years of effort, Congress enacted three major pieces of legislation affecting child care. The *IV-A Child Care Entitlement* provides $1.5 billion over the next five years through Title IV-A of the Social Security Act to be used by states to provide child care assistance to working families who cannot afford child care and are at risk of turning to Aid to Families with Dependent Children (AFDC) for assistance. States are required to match the entitlement funding in order to receive their federal share (Sec. 5081, H.R. 5835, Omnibus Reconciliation Act of 1990, P.L. 101-508).

The Child Care and Development Block Grant authorizes $2.5 billion over three years for states to address the issues of affordability, accessibility, and quality of child care for working parents with children younger than age 13 whose family income is less than 75 percent of the state median income. States are required to use 75 percent of the funds to help families pay for child care or for activities to increase the supply or improve the quality of child care. Twenty-five percent of the block grant funds are reserved for quality improvements and early childhood education and after-school programs (Sec. 5082, H.R. 5835, Omnibus Reconciliation Act of 1990, P.L. 101-508).

The Head Start program was reauthorized at gradually increasing funding levels which will allow Head Start services to reach all eligible children by 1994. Appropriated funding for Head Start for FY 1991 increased to $1.95 billion, which will allow the proportion of eligible children served to grow from one in four to nearly two out of five (Title I, H.R. 4151, *Augustus F. Hawkins Human Services Reauthorization Act of 1990,* P.L. 101-501).

Congress also enacted significant increases in tax credits for low-income working families, totaling $18 billion over the next five years. These include 1) an expansion of the Earned Income Tax Credit (EITC), an income subsidy for working families with annual incomes of less than $20,000, which has also been made refundable; 2) a supplemental credit under the EITC for families with children younger than age one; and 3) a new refundable child health care credit for low-income working families to offset part of the employees' costs of purchasing employer-sponsored health insurance for dependents (Sec. 11111, H.R. 5835, Omnibus Reconciliation Act 1990, P.L. 101-508).

least ten thousand babies — a fourth of those who die each year before their first birthday — if we reach out and ensure comprehensive prenatal care to the quarter of women currently giving birth without it.[24]

We also know that insured infants are less likely than those from uninsured families to be sick or die at birth, and that insured children receive more physician and hospital care.[25] We know as well that in countries where health and sex education are the norm, and contraceptive counseling and devices readily accessible without stigma, teen pregnancies and abortions are far fewer.[26] And we know that we can radically reduce new epidemics of measles and other reemerging childhood diseases by immunizing the third of preschoolers who have been overlooked. Our investment of every dollar in immunization returns about $10, better than most blue chip stocks on Wall Street.[27]

Similar success has been repeatedly demonstrated with the federal nutrition program for pregnant women and children, WIC, and the largest federal preschool program, Head Start. In each instance, government-sponsored, university, and independent evaluations have identified both human benefits in saving lives, improving health, and increasing academic success, as well as short-and long-term cost savings by averting expensive treatment, remediation, and even dependence as children enter adulthood.[28]

While there is also much we do not know about the biology and the social dynamics of childhood, from some of the causes of premature birth to how best to treat drug-abusing mothers with their babies, or what mix of supports in what settings can effectively

---

24. James O. Mason, M.D., "Caring for New Mothers: Pressing Problems, New Solutions," testimony before the Select Committee on Children, Youth, and Families, of the U.S. House of Representatives, 24 October 1989.

25. P. Braverman, G. Oliva, M. G. Miller, R. Reiter, and S. Egerter, "Adverse Outcomes and Lack of Health Insurance Among Newborns in an Eight County Area of California, 1982 to 1986," *New England Journal of Medicine,* 1989, *8*:508–513; and Sara Rosenbaum, "Children and Private Health Insurance," in Mark J. Schlesinger and Leon Eisenberg, editors, *Children in a Changing Health System: Assessments and Proposals for Reform* (Baltimore, Md.: The Johns Hopkins University Press, 1990), pp. 89–130.

26. E. F. Jones, J. F. Forrest, et.al., "Teenage Pregnancy in Developed Countries: Determinants and Policy Implications," *Family Planning Perspectives,* March/April 1985, *17*(2).

27. Select Committee on Children, Youth, and Families, of the U.S. House of Representatives, *Opportunities for Success: Cost-Effective Programs for Children, Update* (Washington, D.C.: Government Printing Office, 1988).

28. Ibid.

aid the most isolated low-income families, this should not stop us from formulating policies based on what we do know. And we know that at a minimum, children need the basic nutrition and preventive health services, early education and child care, and continuous care, education and nurturing throughout their school years that have repeatedly been proven effective.

Both the emerging broad-based consensus and the strong knowledge base about what works give some cause for optimism. But it has also become very apparent that simply extending Head Start to the 80 percent who do not now receive it, or extending WIC to the 50 percent who do not now receive it is not enough. Providing prenatal care, or WIC, or Head Start alone will not inoculate a child against poverty nor compensate for the lack of a safe environment. For many vulnerable children and families, we need a strategy of early, comprehensive, and intensive services, combined with family supports, delivered in their homes, schools, neighborhoods, or communities. To the extent possible, parents and other family members need to be included as informed participants in this strategy.

Crafting the necessary comprehensive strategy to achieve our goals for healthy children and a vigorous, enduring society calls for sustained investment and comprehensive and committed action on the part of many sectors of the society. As healers, scientists and leaders, members of the College — and physicians in general — will be essential participants in this effort.

I am certain that many of you may feel that the medical profession is under assault from cost containment efforts, the litigiousness of society, and the general skepticism that many feel toward authority. But the fact is that no other profession has the clinical, research, and experiential base — or continues to bear the esteem from policy makers at every level — that physicians do. And it seems to me than any organization that has lasted as long as the College of Physicians has demonstrated its ability to adapt to shifting conditions and to bring others along.

During its history, society has repeatedly turned to the College and its members when in need. While the nature of the need has changed, society needs your leadership now. We need your active and enthusiastic advocacy, first, for a comprehensive agenda based on what works — ensuring that all vulnerable parents and children receive comprehensive prenatal and well-child care, and can partici-

pate in high quality nutrition and preschool programs such as WIC and Head Start.

As new policies are enacted, such as Congress's recent expansion of early screening, diagnosis, and treatment services for children under Medicaid, and its improvements in physician reimbursement and service flexibility, we need your collaboration with state and local government, other professional groups, child advocates, and citizens to ensure that these programs are carefully designed to serve the population they are directed to, and that they are fully implemented.[29]

We need you to make common cause across traditional professional boundaries to connect parents and their children with regular sources of preventive and primary care. The anticipated major expansion of Head Start and the new early childhood education and child care legislation offer excellent opportunities for co-locating health and other critical services where children and their parents have ready access. Schools should also be viewed with new openness as places to locate clinics, health-related services, and early and continuous education, including family planning, for health promotion and violence prevention.

As the population changes, we need medical professionals whose education and training reflect that change. No longer should any medical professional be certified without courses in child development and in the ecological as well as biological factors affecting children, especially low-income and minority children. And in conjunction with other health and social services professionals, we need your creative consideration of new ways to make medical services accessible, supportive, and important for people whose daily exigencies place preventive care on the back burner. In addition to new models of training and education, this will involve adjusting the medical workplace to reflect the needs of a changed patient population *and* a changed laborforce.

There also remains a considerable amount that we do not know about how to deliver services most effectively to vulnerable families, let alone what causes some of the difficulties. Here we need your

---

29. Many significant changes in federal maternal and child health programs, including Medicaid and the Early and Periodic Screening, Diagnosis, and Treatment Program, were enacted as part of the Omnibus Reconciliation Act of 1989 (P. L. 101-329). For a detailed description of these reforms, see Children's Defense Fund, "Report on 1989 Maternal and Child Health Federal Legislation," January 1990, unpublished.

support for a major children's venture capital fund, dedicated to interdisciplinary research and development in medicine and other physical and social sciences.

I have suggested an ambitious agenda for policy, but the need is great, the cause is just, and the public is ready. The "incessant watchfulness" of which S. Weir Mitchell spoke eloquently a century ago has evolved into a demand for action — action which is both sympathetic to a population that has changed and informed by the values, the knowledge, and the leadership that are unique to the medical profession and to the College of Physicians of Philadelphia.

629 Cresthill Avenue, N.E.
Atlanta, GA 30306

Report of the President of the College of Physicians of Philadelphia at the Annual Meeting of the Fellowship, 27 November 1990

DANIEL L. SHAW, JR.

Fellows of the College of Physicians of Philadelphia: In appreciation of your interest and involvement, and on behalf of the officers and councilors of the College, I welcome you to the first annual meeting of the College's voting Fellowship under our new By-Laws, which became effective on 1 July 1990.

As a member of the Ad Hoc Committee on Governance, which brought the new By-Laws to the Council and the Fellowship for their approval — and which was so capably chaired by Robert Austrian — I confess that the committee had no firm idea of what an annual meeting was intended to accomplish. Or, rather, picturing ourselves as sage constitution makers, we wisely discerned that it was sufficient merely to create the opportunity for direct yearly communication with the Fellowship into which each generation can pour-in particular contents according to its needs. It frankly did not occur to me at the time that it would be incumbent upon yours truly to pour the first round.

I take consolation in the knowledge that our innovation is really but a restoration of a venerable tradition and an opportunity to provide the Fellowship with a president's view of change and continuity, of progress and plans. It is also an occasion when every voting Fellow of this great College can voice his or her opinions and pose questions to its elected leaders and to its chief executive officer.

Governance and management form a team at the College, and I am privileged to be associated with fine individuals. They advise, they support, they recruit support, they advocate the College's mission — they produce. And standing on a firm platform secured by decades of accomplishments of our predecessors, they have with the Fellowship, the College's staff, and a growing community of friends and supporters, produced quite a lot.

The College of Physicians — which is both a medical academy with a membership of approximately two thousand Fellows and

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 107-112
© 1991 by The College of Physicians of Philadelphia.

also a not-for-profit educational institution with an impressive library, an institute for historical scholarship, and a museum — has a primary obligation to serve three related communities: the Fellowship, the larger medical community, and the general public. Its elected leadership, however, has an even more basic responsibility: to insure the institution's viability and potential for growth, and its ability to change to meet new demands and opportunities. Survival is a prerequisite to service; *growth* is a precondition for *enhanced* service. Accordingly, during the past several years, the College has taken action on several fronts to secure its capacity for continued service during a period of intense pressures on not-for-profit institutions generally.

It is tempting, convenient, and not entirely inaccurate to view the College's new beginning as coincidental with its bicentennial celebration, planned during the presidency of Robert Pressman, whose leadership of this project was largely responsible for its success. The visit to the College on 1 April 1987 of the President of the United States, important in so many respects, helped to catalyze the most ambitious capital campaign in the College's history, the New Century Fund. Identification and cultivation of sources of financial support and the infusion of new dollars into the College's endowment and into its operating budget are keys that unlock our capacity for continued service. From the launching of the New Century Fund campaign in 1986 until the campaign's completion this fall, the College has averaged nearly $50,000 a month in gifts and pledges. As recently announced and soon to be celebrated, the New Century Fund has met its goal of five million dollars. Encouragingly, during this same period annual giving to the College has increased fourfold to nearly $135,000 this past year. In each of the last four years there have been dramatic increases in the number of dollars and steady growth in the number of donors to this yearly effort to support the College's operations and to meet unanticipated needs. We view it as an acknowledgment that those closest to the institution endorse our attempts to strengthen it. These achievements could not have been realized were it not for the dedication, loyalty, and sacrifice of many members of the College's Fellowship, for which, on behalf of the College, I express my profound appreciation.

When speaking of money, it is unsatisfactory simply to consider ways of getting more of what we need. We need prudently to insure that we make the best use of what we already have. To this end,

the Council in March 1989 approved a balanced budget resolution recommended by the Committee on Finance. Soon afterwards the Committee on Investment, chaired by Henry Tumen, put forward a plan that has since been fulfilled to strengthen our endowment by investing a significant portion of our portfolio into vehicles that produce long-term gains. For more years than the College likes to recount, we have utilized capital gains from the sale of stock to provide deficit financing of our operations and have invested to insure needed income for operations. It is our intention to bring in a balanced budget next year.

Two things make this intention realizable. In the first place, we have been aided by the sound fiscal management that a new administration has brought to the College. Executive director John O'Donnell and his staff have been able to increase annual revenues by 29 percent over the past four years while keeping the annual rate of increase of expenses at 4 percent — and all the while maintaining and even enhancing programs by increasing productivity and controlling costs.

The other saving grace was our decision — controversial at the time — to relinquish our Medical Documentation Service (MDS) operation at the end of calendar year 1989. MDS was a gross million-dollar-per-year money maker, abstracting scientific information for pharmaceutical clients. Its success depended upon a large holding of foreign journal titles. The outlandish annual increases in journal prices, volatile copyright legislation, changing laws pertaining to unrelated business income for not-for-profit institutions, rising pension and fringe costs for a staff of over 40 MDS employees, and — perhaps most of all — the commercial nature of the enterprise itself, prompted the decision to curtail the operation.

For the personnel, the curtailment had a happy ending. The College successfully negotiated a buy-out of the operation by the Institute for Scientific Information. The entire management, staff, equipment, and related assets were literally transferred across the Schuylkill River without the loss of a single day's work or salary, and the College benefited financially from the purchase agreement. In financial terms, the decision was immediately favorable because it permitted the Library to decrease its investment in journals and related costs — costs that were projected to cause an annual budget deficit of over half a million dollars by 1994.

The difficulty was rather in emotional terms, a feeling of sadness that the College's Library might be losing its centrality as a

great resource because it was no longer purchasing every journal that rolled off the presses. And there was the apprehension that — by cutting our titles by more than half — we were compromising our capacity for service and depriving ourselves of income from the delivery of documents to institutions and individuals.

Well, the College's pioneering membership in the new Health Sciences Libraries Consortium has obviated the first concern. The 10 participating institutions are developing a joint collections development policy and have installed a shared automated delivery system so that each institution shares the load. No longer can any one institution *afford* to be central. Rapid delivery of biomedical information is the goal; not who has got the biggest modern periodicals holding. Regarding the second concern, I am pleased to report that there has been no decline in the utilization of our library collections, in the income derived therefrom, or in the amount of service we provide. The library is alive and well, and with the removal of MDS and its happy relocation in a commercial environment, we can concentrate our library's resources on our not-for-profit mission and our service to the Fellowship.

It is satisfying to realize and to report that the College has more Fellows to serve. Your leadership subscribes to the view that, as a medical academy, the College should be composed of the most highly qualified members of the medical and scholarly community who, after close scrutiny by the Committee on Fellowship, are invited to its Fellowship. The College's influence would be considerably diminished should the Fellowship be open to all those who have credentials and who choose to apply for membership. In fact, on 22 March 1988, the Council gave formal expression to this previously unwritten tradition when — for the first time in the College's history — it provided the Fellowship with a numerical ceiling of 2,500 members. At the same time, however, it recognized that a long-term regressive demographic trend required reversal. With a median age of 63+ years, the Fellowship was declining in numbers; its rate of induction was not keeping pace with its rate of attrition. The majority of its members constituted a cohort that was, shall we say, actuarially imperiled.

Therefore, in the same breath that the Council established the principle of exclusivity by means of a numerical ceiling, it endorsed a plan to achieve that ceiling as quickly as possible. The goals of that plan included increasing the rate of retention as well as induction, and lowering the median age of the Fellowship by identifying

and recruiting younger candidates. Since the initiation of this plan in November 1989, we have stemmed the declension and have begun to see an upward trend on our charts. Over 130 individuals have been elected to Fellowship, which is twice the annual average throughout the 1980s. At the end of this fiscal year, we anticipate statistical confirmation of our intuitive and anecdotal inferences that we have indeed begun to reinvigorate the Fellowship with younger professionals. At the same time, our "top down" approach to candidate identification and recruitment insures that we are grafting sturdy stock onto our seasoned vines. Simultaneously, we realize that the continued involvement of the Fellows — newcomers and the long-standing faithful — depends significantly on the continual refinement of programs and services that are relevant to the needs of the Fellowship.

"Relevance" is a very relevant word. How does an institution with so many venerable traditions maintain its relevance? How does it cope with rapid social change? How does it meet new demands while remaining faithful to its historic ideals? During his presidency, Lewis Coriell realized that the antique structure of the College's governance, the College's complicated By-Laws, and their anachronistic rendering of the relationship of management to governance made it difficult for the College to respond to changing circumstances and to provide the kind of programs and service that are congruent with the basic mission of the institution and also supportive of the various needs of our core constituents. And so he impaneled the Ad Hoc Committee on Governance. Following 18 months of deliberations, the Committee (whose activities were reported in a series of articles in the *Fellows' Forum*) issued a wide ranging set of recommendations that are evident in our new By-Laws and embodied in our new committee structure as approved by the Fellowship.

Five standing committees of governance (instead of the previous 16) — administration, development, fellowship, finance, and program — along with our Board of Advisors, now regularly report to an executive committee, which, in turn, reports to the Council. The new structure provides a clearer differentiation of function, improved intercommunication, stricter standards of accountability, and a more streamlined approach to institutional business. It is more responsive both to the resolutions of the Council and the recommendations of management. With this modernized system, which has already proved its worth, the College is in a better posi-

tion to articulate its mission, establish its strategic plan, and develop and refine its programs and services accordingly. Investigations in these and many other areas are currently ongoing, and I hope to be able to make the results and products of these investigations the major focus of my report at next year's annual meeting.

Our country's second president, John Adams, wrote that he practiced politics and war in order that his sons could study commerce and mathematics so that their sons and daughters in turn could study art and poetry. In a way, I have been accentuating the foundation building aspects of this progressive view of history. We have restructured the way we govern and the way we manage. We have initiated a development program that has and will continue to successfully seek philanthropic underwriting for our programs. We have taken control of our financial future — at least to the extent that we can accurately foresee. We have begun to review our investment strategies in the interests of the institution's long range future. We have planned and implemented a membership development program that will insure that the College in the twenty-first century will be blessed with "the best and brightest" medical and health care practitioners and scholars, just as we have been blessed in the past. We are now in a position to handle a broad range of questions with deliberation and dispatch.

In focusing on the hard look we have taken at our infrastructure, I realize that I have given short shrift to the many successful conferences, publications, lectures, workshops, cooperative programs and partnerships within the larger community, refinement of services, and scores of accomplishments of many individuals. To the elected leadership, to the appointed members of our council who chair our committees, to the many volunteers who serve on these committees, to the members of the board of advisors whose counsel and support have been invaluable, to the members of the women's committee who take such loving care of our halls, our garden, and our museum guide program, to the institutions and individuals whose external support of the College is increasingly evident, and to the dedicated and talented staff of the College — I extend our deepest thanks and pledge personally my own energies and daily growing enthusiasm for what this great institution has accomplished and for what it has both the capacity and the will to achieve.

College of Physicians of Philadelphia
19 South 22nd Street
Philadelphia, PA 19103

Reviews

MARK V. PAULY and WILLIAM L. KISSICK, editors. *Lessons from the First Twenty Years of Medicare: Research Implications for Public and Private Sector Policy.* 411 pp. Philadelphia: University of Pennsylvania Press, 1988. Price $36.95.

Reviewed by DAVID G. SMITH

This collection of essays resulted from a conference on Medicare convened in 1986 by the Leonard Davis Institute of Health Economics at the University of Pennsylvania. The title of the collection is descriptive: it is more "lessons from" than "plans for"; and the research implications look to remedial changes in the public and private sector rather than toward major alternatives to or for Medicare. There is, for instance, no consideration of national health insurance or even "mandated benefits" as a national policy; and some of the newer initiatives, such as effectiveness research, are explored only minimally. But this is mostly to quibble about what the book is not. It is a survey of Medicare. And 20 years after Medicare's beginning, especially after the tumultuous years of the Reagan presidency, this collection appears at a good time for taking stock.

The book comprises a well-planned and balanced collection of essays. The first section focuses on the history of Medicare and some major policy perspectives. Subsequent major divisions deal with Medicare as insurance; with payment mechanisms and provider behavior; with burdens on beneficiaries and employers; and, briefly, with appropriateness of care, including preventive and post-acute modalities.

Because of their broad range and inclusive scope, the essays provide a varied menu of different approaches and modes of analysis. There is a good review of Medicare history, including specialized consideration of such topics as benefits structure and Medicare-employer involvement. Several policy options, such as capitation and private long-term care insurance are explored. Mark Pauly, one of the editors, adds a novel contribution on the "Positive Political Economy of Medicare." An essay by Jinnet Fowles, et al., explores in a sensitive way the use of Medicare claims data to assess the relation between surgical outcomes and charges for total hip replacements. This reviewer's own favorite is a succinct and informa-

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 113-118
© 1991 by The College of Physicians of Philadelphia.

tive piece by Marilyn Moon on beneficiary burdens. All of this is not to say that there is something for everyone, but that there is much in general to learn about Medicare from this book — even worthwhile gleanings for those already well acquainted with the subject.

On a critical note, the "research implications" are limited by the book's retrospective emphasis upon "lessons" from the past. It is mostly concerned with specific, past "problems" that have arisen with Medicare, such as gaps in coverage, beneficiary burdens, intergenerational transfers, and ways to set a long-term care premium. While this focus makes for immediate relevance and will seem useful to some specialists, it probably means that the material in the book will date rapidly and that "research implications" of continuing relevance may be few. Also, given the current near-crisis in health insurance, the essays seem somewhat remote in their distanced analysis of health care, like Californians living perhaps too serenely on the San Andreas Fault.

As a whole, *Lessons* has a private sector and "pro-competition" bias. For instance, several essays explore the insurance aspects of Medicare, including prospects for long-term care insurance and ways to reduce the intergenerational subsidy. Three separate essays deal with "vouchers" and capitation, underscoring a "pro-competition" emphasis. On the one hand, this kind of analysis is useful because the topics are worthy of exploration and seldom receive attention. But little is added to the debate over capitation, nor is it disclosed how to "fix" the AAPCC or make capitation work, except to express a faith that it can be done. Since so little in the way of positive results has come, as yet, from research and/or demonstrations in this area, this emphasis on capitation seems disproportionate and somewhat precious.

Except for surveying aspects of Medicare, the book lacks a unifying theme or thesis, making a general appraisal difficult. "Research implications" mean largely research on ways to modify Medicare incrementally, which tends to reduce such implications to small, sometimes promising leads. Little attention is devoted to strategic modes of attack, except for capitation. Since no comprehensive or synoptic view is developed, the book's contribution to policy analysis lies mainly in partial and specialized perspectives on different program elements of Medicare.

These comments are not intended, though, to detract from the considerable merits of the collection but rather to describe what it

is and how it may be useful. The book is a well-planned and well-written survey, much better than most conference proceedings. It should prove valuable for acquainting a general reader with a range of Medicare issues and contains information and particular insights useful to more specialized professionals.

Department of Political Science
Swarthmore College
500 College Avenue
Swarthmore, PA 19081

EDWARD B. MACMAHON and LEONARD CURRY *Medical Cover-Ups in the White House.* 171 pp. Washington, D.C.: Farragut Publishing Company, 1987. Price $16.95.

Reviewed by JOHN L. McCLENAHAN

In *Medical Cover-Ups in the White House,* Edward MacMahon, an orthopedic surgeon, and Leonard Curry, a Washington writer, report on the medical care enjoyed by eight American presidents. An additional chapter traces the agonal peregrinations of the late Shah of Iran following his exile, the embarrassment it brought to President Carter, and the suffering of American hostages detained in Tehran. While some of their material is new, much of it has already appeared in print elsewhere. We can bear reiteration, however, that there is room for considerable improvement in the quality of health care provided to our chief executive.

The narrative unfolds in twelve chapters, beginning with a brief history of White House clinicians and concluding with recommendations for their improvement by the appointment of general caretakers and specialists removed from the turbulence of the nation's capital. It is clear that such a task will not be easy, owing to the immense political, social, and bureaucratic pressures that fall on physicians in high places.

Despite federal precautions and regulations, from the early days of the Republic the appointment of the president's doctor has been dealt with rather casually. The choice is usually left to the incumbent. Selection is frequently based on cronyism and legacies from previous administrations, rather than on respect for established, sound, professional qualifications. A roster of White House

doctors reveals modest expertise and a bedazzlement of gold braid — Wilson's Rear Admiral Grayson; Harding's Charles Sawyer, a rural homeopath catapulted to the rank of Brigadier General; Franklin D. Roosevelt's Admiral Ross McIntire; Eisenhower's Major General Howard Snyder; and Kennedy's Rear Admiral George Burkley.

These appointments were presumed to be best suited to keeping presidential policy afloat under pressure by maintaining the necessary secrecy and sustaining the flagrant deception about the president's health. To this end, the measures taken add up to disarray and near catastrophe. The record abounds with dubious manoeuvers and the dissemination of calculated misinformation. From the wholesale fingering of Garfield's chest wound, to Cleveland's clandestine surgery ("He is suffering from his teeth, that is all," his doctor announced, "and a touch of rheumatism."), to Harding's lethal meal of "crab meat," to Wilson's sequestered apoplexy, to Kennedy's Addison's Disease and the disappearance of his internal organs at autopsy, one cannot but marvel at the nation's survival.

Should *Medical Cover-Ups* achieve another edition, there is room for improvement in its format. An index and complete references, a modest retreat from oversimplification of clinical information, and the services of a copy editor to delete such entries as "Chron disease" would be useful. Retrieval too of a multitude of widows — single lines marooned at page tops — to the body of the text is also called for.

535 Telner Street
Philadelphia, PA 19118–4227

SALLY SMITH HUGHES. *Ophthalmology Oral History Series, A Link with Our Past: An Interview with Thomas David Duane, M.D.* 178 pp. San Francisco, Calif.: The Foundation of the American Academy of Ophthalmology, 1989. Price $55.00.

Reviewed by WILLIAM C. FRAYER

Ophthalmic research in 1962 in the United States suffered from a lack of direction. Program directors, many in relatively young departments of ophthalmology, were struggling to develop initiatives, usually with limited financial support. Government funds

came entirely from the National Institutes for Neurological Diseases and Blindness. Only 17 percent of that available money went to ophthalmic research and most of this was earmarked for investigations regarding circulation. The other 83 percent went to neurological research. For the individual investigators, proof of progress was necessary to ensure continued institutional as well as financial backing.

The head of Music Corporation of America, Universal Studios, and other enterprises at that time was Jules Stein, himself an ophthalmologist who had spent most of his life in the entertainment field. Stein wanted to use a portion of his considerable wealth to further ophthalmic research. To this end he founded the organization Research to Prevent Blindness (RPB). To secure needed help in allocating available funds, he and the directors of RPB called on a hitherto obscure ophthalmologist who had been newly appointed professor and chairman of ophthalmology at Thomas Jefferson University in Philadelphia, Thomas David Duane. Their charge to Duane was to conduct a study of ophthalmic research in the United States and to recommend ways in which RPB could help bring about positive changes.

The study was completed and distributed widely among interested parties. It came at an opportune time, serving as a catalyst in the move to create a separate National Eye Institute at the National Institute of Health. Joined by RPB, and many other groups and individuals, Duane became a leader in the successful effort to persuade Congress that ophthalmic research needed its own base.

The founding of the National Eye Institute was the cornerstone for a new and enthusiastic national program of ophthalmic research. More money became available from governmental and private sources for university programs. Program directors, in turn, were able to gather more institutional support and to develop integrated and productive ophthalmic research departments.

All this and more is told in a fascinating volume, *Ophthalmology Oral History Series, A Link with Our Past: An Interview with Thomas David Duane, M.D.*, by Sally Smith Hughes. This intensely personal, autobiographical format seems singularly appropriate for the telling of this story. Working from exhaustive taped interviews, the author has shown great sensitivity in selecting those portions which best portray Duane's personality, his aspirations, and his accomplishments.

Born and raised in Peoria, Illinois, Duane was educated at Harvard University and at Northwestern University Medical School, where he earned a medical degree and a master's degree. He served his residency in ophthalmology at the University of Iowa, where he was also awarded a doctorate in physiology.

The interviews go on to describe Duane's role as chairman of the department of ophthalmology at Jefferson, and later as ophthalmologist-in-chief at Wills Eye Hospital. While at Jefferson, he was influential in developing a new and innovative curriculum. When Wills Eye Hospital decided to join Jefferson, he went to work as ophthalmologist-in-chief to design and build a new Wills Eye Hospital adjacent to Jefferson Hospital. During this process he became widely known for his ability to draw all sides of many controversial issues together and to create a working affiliation between Wills Eye Hospital and Thomas Jefferson University.

During the course of the book Duane outlines many of his thoughts concerning research in ophthalmology. Particularly interesting is Duane's highly original work conducted at the Johnsville Naval Air Development Center. There, employing a human centrifuge that had been constructed for flight training, Duane worked with others in outlining and documenting ocular changes occurring under the influence of positive gravity such as that experienced by pilots.

Throughout his career, Thomas Duane brought a very special quality to the institutions to which he belonged. Introductions by Joseph Gonnella, M.D., Edward A. Jaeger, M.D., and William Tasman, M.D. all bring out many of these positive attributes. Duane's good humor and interest in people, and his devotion to medical education, are all mentioned repeatedly by those who know him best. His autobiography is an accurate measure of his character and his personality. It is a fitting and interesting tribute to a brilliant career.

Scheie Eye Institute
51 North 39th Street
Philadelphia, PA 19104

New Books In the History of Medicine in the Historical Collections of the Library, October Through December 1990

JACK ECKERT

Marianne Bankert, *Watchful Care: A History of America's Nurse Anesthetists* (New York: Continuum Publishing, 1989).

Alistair Cooke, *The Patient Has the Floor* (New York: Alfred A. Knopf, 1986).

Gordon Dammann, *A Pictorial Encyclopedia of Civil War Medical Instruments and Equipment* (Missoula, Mont.: Pictorial Histories Publishing, 1983).

Valerie Fildes, editor, *Women as Mothers in Pre-Industrial England: Essays in Memory of Dorothy McLaren* (London and New York: Routledge, 1990).

Robert Fortuine, *Chills and Fever: Health and Disease in the Early History of Alaska* (Fairbanks: University of Alaska Press, 1989).

Tony Hunt, *Popular Medicine in Thirteenth-Century England: Introduction and Texts* (Cambridge, England, and Wolfeboro, N.H.: D. S. Brewer, 1990).

Gerald Jonas, *The Circuit Riders: Rockefeller Money and the Rise of Modern Science* (New York: W. W. Norton, 1989).

Michael H. Kater, *Doctors Under Hitler* (Chapel Hill: University of North Carolina Press, 1989).

Joseph B. Kirsner, *The Development of American Gastroenterology* (New York: Raven Press, 1990).

Sally G. McMillen, *Motherhood in the Old South: Pregnancy, Childbirth, and Infant Rearing* (Baton Rouge: Louisiana State University Press, 1990).

Rodney B. Nelson III, *Beaumont: America's First Physiologist* (Geneva, Ill.: Grant House Press, 1990).

Anthony Stevens, *On Jung* (London and New York: Routledge, 1990).

Laurel Thatcher Ulrich, *A Midwife's Tale: The Life of Martha Ballard, Based on Her Diary, 1785–1812* (New York: Alfred A. Knopf, 1990).

D. W. Winnicott, *Home Is Where We Start From: Essays by a Psychoanalyst,* compiled and edited by Clare Winnicott, Ray

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 119-120
© 1991 by The College of Physicians of Philadelphia.

Shepherd, and Madeleine Davis (New York: W. W. Norton, 1990).

James Harvey Young, *Pure Food: Securing the Federal Food and Drugs Act of 1906* (Princeton, N.J.: Princeton University Press, 1989).

College of Physicians of Philadelphia
19 South 22nd Street
Philadelphia, PA 19103

Memoir of Harold Glendon Scheie, 1909–1990

WILLIAM C. FRAYER

"I consider [Harold G.] Scheie the best all-around man that we have had in some years," wrote Elias P. Lyon, dean of the University of Minnesota Medical School, in support of Harold Scheie's application in 1936 for an internship at the Hospital of the University of Pennsylvania in Philadelphia. Lyon went on to describe Scheie as "a tremendous worker, one of those who plan their days, accomplish an awful lot, and yet never get worried or hurried. He is accustomed to dealing with all types of people, is courteous, tactful, and yet firm. He shows promise in organization and administration." This was an apt description of a young midwesterner, not yet out of medical school, who was to build a remarkable career in Philadelphia using these very qualities to reach his goals.

Character is formed early. Born of farming parents in Brookings County, South Dakota, on 24 March 1909, young Scheie learned the lessons of self discipline and hard work. In addition to the usual chores he was required to complete on the farm, he began early to seek extra jobs to earn money for his education. He worked at various times as a brickmaker's assistant, a butcher, and an attendant in a public bath; Scheie also ran his own shoeshine concession.

Scheie's family later moved to Warren, Minnesota. By the time he graduated from high school in 1926, he had saved enough money to begin college. Sadly, however, in that same year, both banks in town failed. Scheie's entire savings was wiped out and he had to postpone college for one year.

Attending the University of Minnesota, first as an undergraduate, and later as a medical student, Scheie resided with Dean Lyon for part of this time. In spite of a heavy academic load, Scheie worked at various jobs making enough to support himself and to help with the education of two sisters. He also sent money home to his parents. As a student, he was manager of the parking concession at the Northrop Auditorium where the Minneapolis Symphony played its concerts. One of the cars Scheie parked there belonged to Eugene Ormandy, then conductor of the orchestra, later to become musical director of the Philadelphia Orchestra. The two became fast friends.

Transactions & Studies of the College of Physicians of Philadelphia Ser. 5, Vol. 13, No. 1 (1991); 121-124
© 1991 by The College of Physicians of Philadelphia.

When Scheie moved to Philadelphia it was to begin an internship at the Hospital of the University of Pennsylvania. At the time, no one could foresee the impact Scheie would make on Philadelphia medicine, but he must have made a good impression on his colleagues for he was soon appointed assistant to the chief of staff.

Francis Heed Adler had just been appointed chairman of ophthalmology at the University of Pennsylvania and persuaded Scheie to become his first resident. The two ultimately became partners in the practice of ophthalmology. This was just before the outbreak of World War II, which was to have a significant impact on Scheie's life.

When it became apparent to the armed forces that more medical services would be needed, the 20th General Hospital, later stationed in Assam, was organized by the University of Pennsylvania. Among those on the faculty who volunteered was Harold Scheie. As the only fully-trained ophthalmologist in the area, Scheie's services were much in demand. The wide variety of medical and surgical problems afflicting American troops, as well as those of other nations, provided excellent teaching material for young Scheie. He was obviously overworked, but he characteristically saw an opportunity to expand his clinical and scientific roles. He conducted a study of scrub typhus, the results of which became a standard for this disease.

During his service years Scheie forged lifelong friendships. Included among these was Isidor Ravdin, commandant of the 20th General Hospital, a dynamic leader who returned to Philadelphia to assume a vital role in the postwar growth of the Hospital of the University of Pennsylvania. Another friend was Lord Louis Mountbatten, commander-in-chief of the Allied Forces in the China, Burma, India Theater. He was a patient of Scheie's in the hospital at Assam. Mountbatten was much impressed by Scheie's professional skill and they became lifelong friends.

Upon his return to Philadelphia, Harold Scheie threw himself into the task of strengthening the clinical and residency programs in ophthalmology at the Hospital of the University of Pennsylvania, as well as expanding his private practice. Scheie was a great teacher at the bedside, and residents in those early years were privileged to accompany him on rounds each morning. He was dedicated to education and to helping residents to reach their greatest potential. Scheie was a firm disciplinarian but, most of all, a hard worker who demanded more of himself than he did of others.

Scheie's reputation as a superb clinical ophthalmologist grew rapidly and he was much in demand. He was, above all, a complete physician. Confident in his abilities, he was fully at ease with patients from all walks of life. He gave each person his full attention and was able to evaluate a patient's needs in a very short time. He gave as much to those who could not pay as to those who could. In 1960, he was appointed chairman of the department of ophthalmology at the University of Pennsylvania. Increased funding of the department, growth in research, and enhancement of the residency program were all results of his incredible energy and devotion.

Not long after his return to Philadelphia, and as his practice grew, Scheie began to recognize the possibility of creating an eye institute at the University of Pennsylvania. He envisaged it as a comprehensive eye care facility, including research and clinical components. Scheie became thoroughly engrossed in this project, the completion of which was to be his greatest triumph. In 1972, the Scheie Eye Institute opened on the campus of Philadelphia's Presbyterian Hospital and has served the University of Pennsylvania and Presbyterian Hospital as their departments of ophthalmology since that time. It is a magnificent building, housing facilities for clinical ophthalmology and research.

Harold Scheie gave much to his institution, his profession, his community, and his nation. To his university, he gave 50 years. Scheie's efforts, and his achievements in ophthalmology, medical education, and university affairs were prodigious.

To his profession, Scheie gave his great clinical skill, his precise ethical standards, and a variety of significant and lasting scientific contributions. He was devoted to those medical organizations that he believed were honest and concerned only with the patients' welfare. When asked, he served with great success. He was a regent of the American College of Surgeons, on the editorial boards of many scientific journals, and was often asked to deliver name lectures.

To the Philadelphia area medical community, Scheie also gave his graceful presence. Those who referred patients to him soon learned how supportive he could be. He was proud to be a member of a medical community of such prestige. He served whenever called upon. For the College of Physicians of Philadelphia, he was chairman of the Section on Ophthalmology and chairman of the Finance Committee.

To his nation, Scheie pledged his loyalty. After the war years he remained a reserve officer, rising through the ranks to brigadier

general, a title of which he was justly proud. His leadership abilities, apparent so early, were useful to him during his army career.

Harold Scheie died on 5 March 1990 after a long illness. He leaves a legacy of strength with his family, colleagues, and many friends. He will be remembered by all in Philadelphia as one of the truly extraordinary members of the medical community.

Scheie Eye Institute
51 North 39th Street
Philadelphia, PA 19104

INSTRUCTIONS TO AUTHORS

Manuscripts submitted for publication should be sent to the Editor, *Transactions & Studies of the College of Physicians of Philadelphia*, 19 South 22nd Street, Philadelphia, PA 19103. The Copyright Law makes it necessary for authors to sign an agreement transferring copyright ownership to the journal. Copyright will be released back to authors for most purposes, when requested in writing.

Transactions & Studies, a quarterly publication of the College of Physicians of Philadelphia, is under the editorial supervision of the Francis C. Wood Institute for the History of Medicine. *Transactions & Studies* is a journal of the culture and history of medicine, and a record of College activities. Articles should follow the rules of good scholarship, including the footnote style, outlined in *A Manual of Style*, 13th edition (Chicago, Ill.: University of Chicago Press, 1982). Up to three black and white glossy photographs may be included in articles. Tables must be typewritten on separate sheets; they should be prepared professionally before submission.

Transactions & Studies prefers to receive articles on 5¼ inch computer disk, preferably in "Word Perfect," although other disk sizes and languages are acceptable. Articles on disk should have the notes, in footnote form, listed at the end of the paper. When sending manuscripts as hard copy, authors should submit two copies, typed on one side of 8½ by 11 inch paper; all material, including quotations and footnotes, must be double-spaced. A brief biography of the author should also be included. The author must verify all quotations before the manuscript is submitted for publication. For each quoted passage there should be a specific citation to the primary source, including page numbers. When quotations totaling more than two hundred words of prose, or more than one line of verse, are made from any work still in copyright, the author must secure permission to quote from the holder of the copyright and must see that due acknowledgement is made. Unpublished material, such as a letter, remains the property of the writer or the heirs (no matter who owns the object), and written permission must be secured for any quotation from such material.

Manuscripts must be satisfactorily documented. References should be indicated in the text by superior figures, and should be numbered consecutively. They should be typed on separate pages at the end of the manuscript, and *not at the foot of the manuscript page*. Each reference should be designated by the corresponding number, on the line, followed by a period.

Book references should include the facts of publication [author, *complete title* (place: publisher, date)]. Periodical references should include the year, volume number, and page numbers. The first time a work is referred to in the notes it should be cited in full. Subsequent citations should be by surname of the author and a shortened but unambiguous form of the title, consistently adhered to. "Ibid.," referring to the work named in the immediately preceding reference, may be used when it is unambiguous and effects a real saving of space.

EXAMPLES

William H. Helfand, *Medicine and Pharmacy in American Political Prints* (Madison, Wis.: American Institute of the History of Pharmacy, 1967), p. 35.

Helfand, *Medicine and Pharmacy*, p. 51.

Ibid., p. 60.

Wendy Shadwell, "Britannia in Distress," *American Book Collector*, 1986, 7:1.

A complete set of instructions will be sent, upon request, to authors.

TRANSACTIONS & STUDIES
OF THE
COLLEGE OF PHYSICIANS OF PHILADELPHIA

Series V Volume XIII Number 1 March 1991

MEDICINE AND HISTORY

Contributors v

SPECIAL ISSUE ON MUSEUMS AND MATERIAL CULTURE

Anatomy and Ambition: The Evolution of a Research Institute
JEFFREY P. BROSCO 1

Wax Models in Dermatology
LAWRENCE CHARLES PARISH ALBRECHT SCHOLZ
GRETCHEN WORDEN DANIEL H. PARISH
JOSEPH A. WITKOWSKI 29

Asepsis and the Transformation of Surgical Instruments
JAMES M. EDMONSON 75

COLLEGE LECTURE — The Real Deficit: Child Health and Public Policy in the United States
ANN ROSEWATER 93

Report of the President of the College of Physicians at the Annual Meeting of the Fellowship
DANIEL L. SHAW, JR. 107

REVIEWS

MARK V. PAULY and WILLIAM L. KISSICK, eds., *Lessons from the First Twenty Years of Medicare: Research Implications for Public and Private Sector Policy*
Reviewed by David G. Smith 113

EDWARD B. MACMAHON and LEONARD CURRY, *Medical Cover-Ups In the White House*
Reviewed by John L. McClenahan 115

SALLY SMITH HUGHES, *Ophthalmology Oral History Series, A Link With Our Past: An Interview with Thomas David Duane, M.D.*
Reviewed by William C. Frayer 116

BOOK LIST

JACK ECKERT 119

MEMOIR

Harold Glendon Scheie (1909–1990)
WILLIAM C. FRAYER 121